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THE PSYCHOLOGICAL BULLETIN

I. GENERAL

1. MURSELL, J. L., The Principle of Integration in Objective Psychology. *Amer. J. of Psychol.*, 1924, 35, 1–15.

A number of theories of integration in behavior are critically reviewed. The first theory discussed is neurological associationism, which attempts to describe the phenomena of learning in neural terms. The great difficulty of all theories of this type is their highly hypothetical nature. Even the almost universally accepted concept of lowered synaptic resistance as a result of activity is at most an explanation in terms of the least understood portion of the nervous system and, therefore, an appeal to ignorance rather than an explanation. Moreover, there are serious difficulties inherent in it. Neurological schemata are scientifically valueless in that they do not lead to further investigations, are misleading as pedagogical devices, and are incapable of interpreting the individual-social aspect of behavior. Theories which attempt to describe behavior in terms of reflexes and their conditioning ("reflexology") are exceptionally vague in their use of the term reflex. The conditioned reflex fails to exhibit even the elements of the learning process in that learning is far too complex a process to be possible of explanation in terms of the simple process of conditioning. Reflexology tends to break behavior up into segments, while the interest of psychology is focused upon the pattern and not upon the elements which constitute it. The concepts of the *Gestalt-psychologie* start with the result of integration and deny the existence of elements which are integrated in learning instead of solving the problem of integration. Integrated behavior may be considered as a result of *mnemic causation*. This concept means that any response is to be explained not merely in terms of the proceeding

stimulating situation but in terms of the stimulating situation together with a past series of stimulus-response complexes. Such a concept gives a psychological explanation of integration which, as a psychological phenomenon, cannot in any case be reduced to physiological terms. It is adequate to the explanation of the social aspects of behavior and constitutes a fruitful hypothesis for further work in objective psychology. G. J. Rich (Pittsburgh).

2. Roback, A. A., A Supplement to " Behaviorism and Psychology." *Amer. J. of Psychol.,* 1924, 35, 103–109.

A reply to Dr. Hunter's review of the writer's *" Behaviorism and Psychology."* G. J. Rich (Pittsburgh).

3. Langfeld, H. S., The Seventh International Congress of Psychology. *Amer. J. of Psychol.,* 1924, 35, 148–153. G. J. Rich (Pittsburgh).

4. Bishop, H. G., A Simple Apparatus for the Determination of the *RL* or *DL* of Color by the Method of Constant Stimuli. *Amer. J. of Psychol.,* 1924, 35, 155–156. G. J. Rich (Pittsburgh).

5. Seashore, C. E., A New Rhythm Apparatus. *Science,* 1924, 59, 146–147. G. J. Rich (Pittsburgh).

6. Dodge, R., Problems of Human Variability. *Science,* 1924, 59, 263–270.

Human variability has been regarded scientifically in three ways: as an indication of the impossibility of a science of the human mind, as accidents to be expressed in terms of the theory of chance errors, and as facts to be taken into account and studied in detail. Generalizations which lump variable quantities into statistical measures and treat the variations as unavoidable errors are frequently sterile, even if they do not lead to purely artificial constructions. If the general problem of variability is considered as one to be faced and met with detailed description, a host of special problems become significant. There is a gap to be bridged between general physiology and the psychology of sensation. The effects of repetition of stimuli need to be studied. The refractory phase of the reflex arc has been investigated but that of voluntary reactions is still a subject for research. There is evidence to show that refractoriness does occur in cortical

reactions despite appearances to the contrary. The place of refractory phase in the development of reaction systems is also important. A further problem of variability is concerned with the effects of concurrent processes upon one another. Several special cases have been studied, showing that in certain instances reflexes initiate more complex motor responses. G. J. RICH (Pittsburgh).

7. PATTIE, F. A., JR., A Blower of the Galton Whistle. *Amer. J. of Psychol.*, 1924, **35**, 308–309. G. J. RICH (Pittsburgh).

8. BISHOP, H. G., A New Psychological Spectrum. *Amer. J. of Psychol.*, 1924, **35**, 309–310. G. J. RICH (Pittsburgh).

9. YOUNG, K., The History of Mental Testing. *Ped. Sem.*, 1923, **31**, 1–48.

Mental testing to-day shows the convergence of four streams of scientific development: German, French, English, and American. The German influence was in the nature of experimental method and the production of certain separate experimental materials later utilized for tests. The former is shown in Wundt's influence upon Kraepelin, Cattell, etc.; the latter in Ebbinghaus' completion, computation, and memory tests, Kraepelin's tests of practice, association, etc., Stern's ratio between chronological and mental age. The French influence was mainly from the medical side of psychology (Ribot, Charcot, Janet) with its interest in the feebleminded (Seguin) and in the higher thought processes, culminating in Binet's epoch-making formation of the first complete battery and scale of intelligence tests and based upon the concept of mental age and of intelligence as a general capacity. DeSanctis' work in Italy was directly stimulated. The English contribution has been primarily that of the statistical methods of treating test data. Galton's various studies of individual differences in imagery, association, mental inheritance, may be considered the principal original stimulus to the whole testing movement, and the mathematical refinements of his statistical methods by Pearson and Spearman are significant for methodology. The present trend in mental testing in England is critical in nature.

In America mental measurement received its initial stimulus from Cattell's statistical study of individual differences and his systematic application of batteries of tests. Under Hall's influence Boas, Gilbert, Goddard, and others studied children both statistically and in

the clinic, leading to refined clinical methods of the last named, and of Kuhlman, Wallin, and Huey. Terman firmly established the Binet method in America; from which variations have developed in the Huey and Yerkes point scale idea, the Otis group test, and the performance tests of Healy, Knox, Pintner, and Porteus. The writer of the article feels that the current trend toward increased complexity of statistical treatment is evidence of partial failure in getting at the real meaning of intelligence or of the inadequacy of mere intelligence testing to meet the demands for knowledge of personality. J. F. DASHIELL (North Carolina).

10. HUNTER, W. S., The Problem of Consciousness. *Psychol. Rev.*, 1924, 31, 1–31.

The paper aims to formulate a position acceptable to the introspective psychologist and to the student of behavior. The observable phenomena of consciousness are to be included within psychology; denial of their existence will not win a wide following. Professor Hunter limits the problem of consciousness to situations which involve language. In organisms which possess "(1) a certain receptor capacity, (2) a certain habit history, and (3) language ability," the presentation of a stimulus and an instruction may be followed by language activity. When language behavior follows stimulation there exists the Type-X situation. Let SP = sensory process and LR = language response. Then "*The irreversible relationship SP-LR is the phenomenon termed 'consciousness.'*" The establishment of irreversible SP-LR relations is illustrated by the stimulus limen for contact and the discrimination of partials in a clang. Various questions are raised and discussed on the basis of the above formulation. In conclusion Professor Hunter states that a science devoted and limited to study of the Type-X situation, involving the irreversible SP-LR relationship, is a possibility, but such a science is not wise and desirable. P. T. YOUNG (Illinois).

11. WEISS, A. P., Behaviorism and Behavior. *Psychol. Rev.*, 1924, 31, 32–50, 118–149.

Behaviorism is a physical science and behavior a form of motion. Physical monism rules out the existence of any consciousness or psychical entity. "The formulation of the behavioristic position is then expressed in the statement that all human conduct and achievement reduces to *nothing but:* (a) different kinds of electron-proton

groupings characterized according to geometrical structure; (b) the motions that occur when one structural or dynamic form changes into another." Behaviorism stands intermediate between physiology and social studies of human response. There is a biophysical and a biosocial type of behaviorism. The former, or muscle-twitch type, is physiological. The latter considers such matters as the following: that different stimuli evoke the same social response, that an individual has a stimulating effect upon others, and that individuals at first exploit and then coöperate with others. In the second part of the paper Professor Weiss considers human response under three headings: (1) *Biophysical.* A six-fold grouping of "muscle-twitch" responses is given and this is followed by a brief discussion of cerebral integration. (2) *Implicit responses.* Under this topic the author considers the genesis of the implicit response, the behaviorist's view of the image and the stream of thought, and his view of the nature of thinking and of the introspective response. (3) *Biosocial responses (overt behavior).* Under this topic the author discusses discrimination, serial and relational responses, generalization and abstraction, the self, and language behavior. In a concluding paragraph Professor Weiss presents tentatively his views upon the aims of behaviorism. P. T. Young (Illinois).

12. Wheeler, R. H., A Psychological Description of Intelligence. *Psychol. Rev.,* 1924, **31**, 161–174.

The paper aims to describe some of the ordinary meanings of intelligence. Among other meanings intelligence is defined as "*derived covert behavior.*" P. T. Young (Illinois).

13. Spranger, E., Kants kritische Methode in geistesgeschichtlicher Belauchtung. *Deutsche Schule,* 1924, **28**, 146–153.

Die geistesgeschichtliche Methode versucht das Schaffen des grosse Geistes aus Motiven seines Denkens zu verstehen, die ihm selbst verborgen bleiben mussten, da er sich nicht aus seiner Zeitlage herauslösen konnte. Eine Betrachtung der Entwicklung der Rechtsideen im 18. Jahrhundert zeigt gewisse Parallelen zu Kants kritischer Methode. Beide versuchen, aus einem im jedem Individuum liegenden überindividuellen Prinzip die Gültigkeit vom Recht des Rechts bezw. von der Erfahrung als allgemein-gültigem Erkenntniszusammenhang zu erfassen. Letzte Ursache dieses Mühen wird in einer gewissen Einheitlich keit der Bewusstseinsstruktur der Menschen

des Aufklärungszeitalters gesehen, deren hervorragendster Zug ein weit vorgeschrittener Individualismus ist. Der Ueberwindung dieses Individualismus durch "Freiheit, welche die höchste Würde des Einzelnen bedeutet, zugleich aber immer und notwendig Bindung an ein selbstbejahtes Gesetz" ist, gilt letzten Endes Kants kritisches Schaffen. H. Bogen (Berlin).

14. Schulte, R. W., Die Persönlichkeit in der psychologischen Beratung. *Z. f. angew. Psychol.*, 1924, **23**, 352–356.

Programmatische Forderungen in Bezug auf die Zusammenarbeit von Medizin und Psychologie. H. Bogen (Berlin).

15. Allport, G. W., Die theoretischen Hauptströmungen in der amerikanischen Psychologie der Gegenwart. *Z. f. päd. Psychol.*, 1924, **25**, 129–137.

Von den Hauptströmungen werden charakterisiert: Der Functionalism (James, McDougall, Angell u. a.), der Structuralism (Titchener, Dodge), der Behaviorism (Watson, Allport, Perry), die Stellung der amerikanischen Psychologie zur Psychanalyse und ihre Arbeit in der Testpsychologie. Dem Berichterstatter kommt es darauf an, in kurzen Zügen zu verdeutlichen, worin die Abhängigkeit der amerikanischen Psychologie von der gleichgerichteten Arbeit in der alten Welt abhängig ist, und in welchen Punkten sich originales amerikanisches Denken durchsetzt. H. Bogen (Berlin).

16. Clark, J. H., A Simple Method of Measuring the Intensity of Ultraviolet Light with Comparative Results on a Number of Physiological Reactions. *Amer. J. of Physiol.*, 1924, **69**, 200–209.

Ultraviolet light has recently been employed therapeutically and the need for some method of determining ultraviolet dosage quantitatively for general clinical purposes has arisen. The writer describes in detail the effect which ultraviolet light has of darkening lithopone paint and suggests this as a satisfactory and practicable means of measurement of dosage. M. J. Zigler (Wellesley).

17. Drinker, P., Laboratories of Ventilation and Illumination, Harvard School of Public Health, Boston. *J. Indus. Hyg.*, 1924, **6**, 57–66.

Floor plan, photographs, and general description. D. A. Laird (Colgate).

2. NERVOUS SYSTEM

18. Rich, G. J., The Functions of the Sympathetic System in Current Psychological Tests. *Amer. J. of Psychol.*, 1924, **35**, 153–155.

Many textbooks of psychology describe the autonomic nervous system as though it functioned independently of the cerebrospinal system. This view of its action is incorrect. G. J. Rich (Pittsburgh).

19. Lasareff, P., The Theory of Nervous Activity. *Science*, 1924, **59**, 369–371.

The ionic theory of stimulation gives a quantitative coördination of known facts and predicts the existence of phenomena not yet observed. Colorless vision is considered as an example and is explained in terms of ionization. Formulas are given for the effect of light on the end-organ and for adaptation which agree with observations. It follows from the theory that visual fatigue is of the retina alone and not of the brain centers, and this fact has been demonstrated experimentally. The entire theory is based upon the premise that the difference in the intensity of sensation depends, in general, upon the difference in the ionic concentration in the retina. G. J. Rich (Pittsburgh).

20. Troland, L. T., The Optics of the Nervous System. *Amer. J. of Physiol. Optics*, 1924, **5**, 127–153.

An attempt to trace the effect of a visual stimulus from the periphery to consciousness. The effects in the retina, optic nerve and tracts, and in the cerebral cortex are outlined. The stumbling block to a purely mechanical and physical explanation, however, is in the changing of the cerebral image to the image of consciousness. "We shall be able to account for all of these transformations in purely physical terms, as steps in a physically continuous process. But the step from the highest brain image to consciousness is not a transformation; it is a transmutation, accomplished by an alchemy unknown to physics." S. W. Fernberger (Pennsylvania).

21. Franz, S. I., Conceptions of Cerebral Functions. *Psychol. Rev.*, 1923, **30**, 438–446.

The phrenological view of cerebral localization as stated by Gall and Spurzheim considers the mind to be a collection of diversified

faculties or functions which have strict localization. The work of Broca upon the centers of speech and the later work of Fritsch and Hitzig brought to the fore the doctrine of strict cerebral localization. The phrenological concept may be absurd philosophically but it has some clinical value. The facts of functional restitution or reëducation after cerebral lesion cannot be understood and explained on the basis of the phrenological hypothesis; they point rather to the view of Flourens that the brain functions as a whole. Images cannot be accounted for by referring to localized cerebral cells. P. T. YOUNG (Illinois).

22. ROGERS, F. T., Studies of the Brain Stem: VIII, Diuresis and Anhydremia Following Destruction of the Thalamus. *Amer. J. of Physiol.*, 1924, **68**, 499–506.

Complete decerebration and destruction of the thalamus in pigeons, with minimal damage to the remainder of the brain, is followed by excessive loss of body water and marked diuresis. The period of life following this operation is dependent upon the extent of the resulting anhydremia. If the initial loss of body water does not exceed a rate of about 14 per cent of the total body weight per 24 hours, such birds may be kept alive for several weeks; if the diuresis and resulting anhydremia reaches a rate of about 18 per cent of the body weight per 24 hours, death invariably occurs within 36 hours. M. J. ZIGLER (Wellesley).

23. ROGERS, F. T., Studies of the Brain Stem: IX, On the Relation of Cerebral Puncture Hyperthermia to an Associated Anhydremia. *Amer. J. of Physiol.*, 1924, **68**, 507–516.

Decerebration and destruction of the thalamus in pigeons leads to diuresis and anhydremia, which, if severe enough—a loss exceeding about 15 per cent of the body weight per 24 hours—induce hyperthermia. If the pigeons are deprived of water for some time previous to the operation hyperthermia is more easily induced. It is remarked that this type of hyperthermia is "induced by a cerebral lesion without involvement of presumed temperature regulating centers in the corpus striatum." M. J. ZIGLER (Wellesley).

24. BRUNSCHWEILER, H., The Afferent Sensory Wave. *Schweizer Arch. f. Neurol. u. Psychiat.*, 1924, **14**, 68–76.

Study of tracts of the exposed spinal cord of a dog by the electrocardiograph indicated that different tracts have different wave forms.

Different stimuli produce varying wave forms in the same tract, indicating a specialization of sensory responses before the impulse reaches the midbrain. D. A. Laird (Colgate).

3. SENSATION AND PERCEPTION

25. Reid, A. C., The Effect of Varied Instruction on the Perception of Lifted Weights. *Amer. J. of Psychol.*, 1924, **35**, 53–74.

This study undertook to measure the effect upon the discrimination of lifted weights of three sets of instructions: to judge the weights as weights, that is, as objectified material things; to judge in terms of the pressure-pattern set up on and in the fingers and thumb of the lifting hand; and to judge in terms of the pressure-pattern set up in the wrist. The statistical results (thresholds and measures of precision) are considered in terms of the observers' reports of the criteria of their judgments, reports which showed that in a majority of cases the instructions were exceeded or contaminated. The statistical data are treated qualitatively by being rearranged under the types of judgment which the observer reported giving instead of under the type to which they should have belonged had the instructions been successful in producing the desired attitude. Of the three bases of judgment, the attitude of judging the weights as material objects gave the most accurate results. It afforded a more stable basis of judgment than did pressure-pattern on and in the fingers; and this in turn afforded a more stable basis than did pressure-pattern in the wrist. G. J. Rich (Pittsburgh).

26. Boring, E. G., Is There a Generalized Psychometric Function? *Amer. J. of Psychol.*, 1924, **35**, 75–78.

Fernberger's computations of the effect of practice upon the deviation of observed results from the phi-gamma theory fails to show any bettering of approximation to the theory as a result of practice. This is to be expected so long as the search for a generalized psychometric function is continued. No psychometric function can be expected to apply to all cases. A function that is "normal" for one unit of measurement will be skewed when another unit is used. G. J. Rich (Pittsburgh).

27. Angell, F., Notes on the Horizon Illusion: I. *Amer. J. of Psychol.*, 1924, 35, 98–102.

Zoth's theory, that the horizon illusion is due to the tendency of the eyes to diverge when raised to look upward, was tested by the projection of after-images at different altitudes. No significant change in size accompanied elevation or lowering of the eyes. A theory which takes into account comparison of the sun or moon with other objects in the visual field is more satisfactory than one based upon eye movements or the dimming effect of the atmosphere. G. J. Rich (Pittsburgh).

28. Elliott, M., West, J., and Hoisington, L. B., The Spatial Limen for the Four Principal Film Colors. *Amer. J. of Psychol.*, 1924, 35, 125–131.

The chromatic thresholds for the four principal hues were determined by the use of colors which were equated to one another with respect to both brightness and saturation. Film colors were produced by having the observer view them through a small hole in a gray screen of the same brightness as the colors. As the size of this hole was kept constant, the size of the color in terms of visual angle was regulated by varying the distance of the observer from the apparatus. Observations were made under both intense and weak illuminations. The limen, in terms of the visual angle, was found to be about the same for R and G and for B and Y, the latter being nearly twice the former. The film colors showed a greatly increased saturation over the surface colors when the observer sat just within the liminal distance of the film color. G. J. Rich (Pittsburgh).

29. Wells, F. L., The Audibility of Sounds. *Science*, 1924, 59, 399.

The order of the sounds of letters of the alphabet with respect to their frequency of misperception is noted. G. J. Rich (Pittsburgh).

30. Braddock, C. C., An Experimental Study of the Visual Negative After-Image. *Amer. J. of Psychol.*, 1924, 35, 157–166.

Negative after-images from surfaces, film colors, flat objects, bulky (transparent) objects and opaque tridimensional objects were obtained and projected upon the field of the closed lids, a gray screen, the original fixation with the object removed, the object in dimmed light on the walls of the darkroom. The observers were instructed to describe the after-image in terms as nearly attributive as possible.

When regarded critically, the negative after-image proved to be a film—textureless, dimensionless, in a strict sense shapeless, and without locality. A tendency toward objectivity on the part of the observer caused perceptive differences to appear; localized images, shape outlines, definite texture. These characteristics disappear as soon as the objective attitude becomes critical. G. J. Rich (Pittsburgh).

31. Shimberg, M., The Rôle of Kinesthesis in the Perception of Rhythm. *Amer. J. of Psychol.*, 1924, **35**, 167–184.

In this experiment the observers reacted to unknown (Esperanto) words when the words became meaningful, and reported upon consciousness during the search for meaning. In practically all the cases imagery was reported. Of these, kinesthetic images were the most important, being 57 per cent of all images. Internal speech was the most usual form of kinesthesis. When the reaction times were long and the search for meaning labored and difficult, kinesthetic images usually appeared. When the meaning came readily, it was often carried by visual or auditory images without kinesthesis. There were individual variations in the use of imagery. G. J. Rich (Pittsburgh).

32. Taylor, G. H., Color Testing and the Psychology of Color. *Amer. J. of Psychol.*, 1924, **35**, 185–189.

Color-blind persons show a distinctly different facial expression during the Holmgren wool test from those who are color-efficient, as well as a slight tremor of the hands and voice. The reactions of tone-deaf subjects are similar but differ in the inflection of the voice. G. J. Rich (Pittsburgh).

33. Ferree, C. E., and Rand, G., The Cause of Disagreement Between Flicker and Equality-of-Brightness Photometry. *Amer. J. of Psychol.*, 1924, **35**, 190–208.

The eye's response to light varies with the duration of the stimulus. It is not a simple function, but an irregular function of three variables: wave-length, intensity, and time of exposure. Thus, the effect of time of exposure is different for every wave-length and for every intensity. In the method of flicker the eye is underexposed, while in the equality-of-brightness method the exposure may be of sufficient length to allow the sensation to reach its maximum. The effect of

underexposures is not obliterated in the succession of exposures which occur in the method of flicker. Ratings made by the equality-of-brightness method with tachistoscope exposures equal in length to the exposure of the flicker disc agree with ratings made by the method of flicker. G. J. Rich (Pittsburgh).

34. Ferree, C. E., and Rand, G., Flicker Photometry and the Lag of Visual Sensation. *Amer. J. of Psychol.*, 1924, 35, 209–216.

Curves are given for the rise of visual sensations with time of exposure. The curves were obtained by determining successively the just noticeable differences of luminosity from zero to maximum luminosity as the time of tachistoscope exposure of the light was increased. Curves are given for four colors and white, each at four intensities, and are compared with brightness ratings by the equality-of-brightness method and by the method of flicker. G. J. Rich (Pittsburgh).

35. Weinland, J. D., The Effect of Grouping on the Perception of Digits. *Amer. J. of Psychol.*, 1924, 35, 222–229.

Groups of six digits were exposed tachistoscopically. They were arranged in five groupings: 6, 3–3, 2–4, 4–2, and 2–2–2. The highest degree of accuracy was found for the 6 and 2–2–2, which did not differ significantly between themselves. The results from the 2–4 and 4–2 arrangements, likewise very close together, occupied an intermediate apparition. The 3–3 grouping was definitely the worst with respect to accuracy. G. J. Rich (Pittsburgh).

36. Bush, A. D., and Austin, A. M., Weber's Law as Tested by Flowing Increments. *Amer. J. of Psychol.*, 1924, 35, 230–234.

The differential limens for pressure on the hand and for tension (lifting from the wrist) were determined at three standards. The stimulus in every case consisted of a beaker into which water was allowed to flow continuously. No comparison stimulus was used, the observers reporting when the beaker seemed heavier than it had been. The liminal values found were not in accord with Weber's law. With the water flowing into the beaker at different rates, it was found that the limen was smallest for the slow rates of increase but that the time from the beginning of the increase in weight until the threshold was reached was least for the fastest rates of flow. G. J. Rich (Pittsburgh).

37. Spencer, L. T., A Quantitative Experiment on the Purkinje Phenomenon. *Amer. J. of Psychol.*, 1924, 35, 264–266.

A class experiment to demonstrate quantitatively the Purkinje phenomenon is described. A series of colored papers is arranged in daylight according to brightness and resorted in a dark room under varying degrees of illumination. The experiment shows the shift of brightness under low illumination as well as the decrease in ability to distinguish colors. G. J. Rich (Pittsburgh).

38. Ginsberg, D., and Hoisington, L. B., The R L of Increased Chroma with Film Colors. *Amer. J. of Psychol.*, 1924, 35, 269–272.

The relative saturations of a surface and a film color (equated for hue and brightness) were compared, and the size of the hole through which the film color was seen varied until equality of saturation was obtained. This procedure gave chromatic thresholds in terms of the visual angle subtended. The two simultaneous experiences demanded different attitudes. It was not the same thing to judge the saturation of a perceived color (surface) and that of a color that was non-perceived (film). Factors of saturation, volume, and luminosity were bound together in the film color; one could not be eliminated without eliminating the others. G. J. Rich (Pittsburgh).

39. Rubin, B. R., and Weld, H. P., A Preliminary Study of the Bourdon Illusion. *Amer. J. of Psychol.*, 1924, 35, 272–279.

A disc containing black figures was revolved at different speeds behind a screen in which there was a window. When the objective movement of the figures was upward, they were seen to move in that direction with slow rotation of the disc. When the figures followed one another at rates of from 0.2 sec. to 2 sec. (optimal rate, 0.6 sec.), the movement was seen to be upward and then downwards (sometimes only downward). The downward movement, the illusory phase, had as its psychological correlate a filmy and lively gray which is not given objectively, and which is phenomenologically different from the black figures and white background of the disc. It seems to be the same sort of gray as that found in the tachistoscopic illusion of movement. When the objective movement was downward, similar results were obtained in the reverse direction. G. J. Rich (Pittsburgh).

40. Boring, E. G., Attribute and Sensation. *Amer. J. of Psychol.*, 1924, **35**, 301–304.

A series of experiments is reported in which the observers made judgments of slight differences of visual intensity or extensity, and while judging under one determination were occasionally asked to give an *ex post facto* judgment of the other attribute. This latter secondary judgment was usually delayed and always issued from a surrogate of some sort, sometimes a reinstatement of the perception. The instructions did not operate retroactively upon the original perception. Under the experimental conditions, it was not possible to reduce a perception to a single attribute. G. J. Rich (Pittsburgh).

41. Titchener, E. B., The Overlooking of Familiar Objects. *Amer. J. of Psychol.*, 1924, **35**, 304–305. G. J. Rich (Pittsburgh).

42. Neifeld, M. R., The Color Sensation Theory of Dr. Schanz. *Amer. J. of Physiol. Optics*, 1924, **5**, 242–249.

Criticism of the Schanz theory. S. W. Fernberger (Pennsylvania).

43. Sheard, C., The Physiological Effects of Radiant Energy, Especially upon the Human Eye. *Amer. J. of Physiol. Optics*, 1924, **5**, 214–241.

From a discussion of the effects of radiant energy on microorganisms and on muscle and blood and the skin, the author considers the transmission of the ocular media. The possibility of certain eye defects being due to ultra-violet or infra-red rays is discussed. S. W. Fernberger (Pennsylvania).

44. Venable, W. M., Color and Luminosity: II. *Amer. J. of Physiol. Optics*, 1924, **5**, 170–204.

A consideration to sensitivity to differences in hue and of the facts of color mixture. From these considerations the author works out a complete color chart from which it is possible to work out all of the color ratios. S. W. Fernberger (Pennsylvania).

45. Flagg, P. J., A Scientific Basis for the Use of Color in the Operating Room. *Mod. Hospital*, 1924, **22**, 555–559.

Advocates the use of a bluish green in place of the common white since it is complementary to the color of the field of operation and would lessen color fatigue. D. A. Laird (Colgate).

46. Sheard, C., Illumination and Its Effect on the Human Eye. *Nat. Health,* 1924, **6**, 316–318, 374, 378.

Summary of practical illuminating hygiene, with most emphasis on glare. D. A. Laird (Colgate).

47. Kroner, K., Itching. *Klin. Wochenschr.,* 1924, **3**, 351–353.

Itching has little to do with hyperesthesia or hyperalgesia since it persists after injection of cocain; on the other hand, it is relieved by drugs acting on vascular system, such as atropin. Kroner attributes itching to special nerves of the vegetative nervous system. D. A. Laird (Colgate).

48. Peiper, A., Sense Perceptions in the Prematurely Born. *Jahrb. f. Kinderheilk.,* 1924, **104**, 195–200.

Organs investigated responded as well as in full-term babies. D. A. Laird (Colgate).

49. Edridge-Green, F. W., Temporary Color Blindness. *Lancet,* 1924, **206**, 801–802.

Man recovering from influenza developed red-green blindness which disappeared five months later. D. A. Laird (Colgate).

4. FEELING AND EMOTION

50. Michaels, G. M., Color Preference According to Age. *Amer. J. of Psychol.,* 1924, **35**, 79–87.

The boys in every grade in a school stated their preference for six colors displayed simultaneously. The colors B, R, Y, and G, in that order, tended to have definite relative positions. The positions assigned V and O showed considerable variability. Judgments of first grade pupils showed little reliability. Beyond the age of six reliability increased, and the judgments of the nine-year group were the most representative of the judgments of the entire school. A check test showed that color names could be substituted for actual colors with little influence upon the results. G. J. Rich (Pittsburgh).

51. Washburn, M. F., Devo, D., and Marks, D., A Further Study of Revived Emotions. *Amer. J. of Psychol.,* 1924, **35**, 113–120.

The observers in this experiment were instructed to recall an emotional situation and report upon the revived emotion. The

intensity of the emotion, the time required for its revival, and the time since the original experience occurred were noted. The emotions revived were joy, anger, fear, pride, and shame. Joy was recalled most intensely and tended to be recalled from recent date. Anger was recalled in moderate intensity, slowly, and from recent date. Fear was the most weakly recalled, recurred slowly when intense, and was revived from experiences of early date. Pride was recalled rapidly, with considerable intensity, from dates not very remote. Shame was recalled from early dates with an intensity that was usually weak but occasionally very high. G. J. Rich (Pittsburgh).

52. Miller, H. C., The Physical Basis of Emotional Disorder. *Lancet,* 1924, **206**, 378–381.

Cases to show how apparently psychogenic emotional disorders may be complicated by somatogenic factors largely through the endocrine and autonomic systems. D. A. Laird (Colgate).

5. MOTOR PHENOMENA AND ACTION

53. Banister, J. M., Functional Anomalies of the Ocular Muscles. Their Nature, Their Detection, and Their Significance. *Amer. J. of Physiol. Optics,* 1924, **5**, 154–169. S. W. Fernberger (Pennsylvania).

54. Dallenbach, K. M., Dr. Johnson on Reaction-Time Experiments. *Amer. J. of Psychol.,* 1924, **35**, 305–307. G. J. Rich (Pittsburgh).

55. Hoskins, R. C., The Functions of the Endocrine Organs. *Sci. Monthly,* 1924, **18**, 257–272.

Some of the bearings of strictly experimental data upon endocrinology are suggested. Pineal deficiency as the specific cause of *macrogenitosomia precox* has not been conclusively demonstrated; nor has the necessary involvement of any part of the pituitary in the condition *dystrophy adiposogenitalis*. Gigantism but not acromegaly has been reproduced experimentally. Results seem to show that the function of the thyroid is to serve as a slowly acting regulator of energy discharge to aid in adapting the animal to its environment. Work on the parathyroids is yet inconclusive. As for the adrenals, the results have been consistent in showing that animals survive the

loss of the medulla but not that of the cortex; and at present experimental work is not finally determinative from among rival conceptions of the general function of the adrenals, such as Cannon's emergency theory, Pende's tonus theory, the augmentation of basal metabolism, the resisting of fatigue, a detoxicating mechanism. The important incretory functions of the male sex glands seem to be experimentally traceable to the interstitial cells, and the maintenance of the estrual and menstrual cycles of the female to the follicular hormone. J. F. DASHIELL (North Carolina).

56. ZIGLER, M. J., Instinct and Psychological Viewpoint. *Psychol. Rev.*, 1923, **30**, 447–460.

The author has examined the definitions of instinct given in a number of current textbooks of psychology. He finds considerable variation in the manner of treating the topic and in the emphasis placed upon certain of its phases. Despite this variation the writers agree upon five or six basic characteristics of instinct (449-50). The definitions of instinct are classified as (1) neurological, (2) biological, (3) psychological. Instinct furnishes a problem for several distinct fields of investigation. Divergence in the treatment of the topic by psychologists and others reflects difference of point of view. P. T. YOUNG (Illinois).

57. BERNARD, L. L., Neuro-Psychic Technique. *Psychol. Rev.*, 1923, **30**, 407–437.

Environmental conditions control the actions of the simpler forms of living organism. In the more complex forms, habit, especially implicit habit, and language are increasingly important, while tropism and instinct play a decreasing rôle. The author discusses the place of consciousness in the control and evaluating of action. With man the passing of tradition from mouth to mouth, and later its transmission by means of written document, has brought relative freedom from the immediate control of the physical environment. Social and mental transmission are of greater importance to the sociologist than biological inheritance and instinct. P. T. YOUNG (Illinois).

58. TUTTLE, W. W., An Apparatus for Eliciting and Recording the Patellartendon Reflex. *Amer. J. of Physiol.*, 1924, **68**, 338–344.

Full description, with diagrams, of an apparatus by which quantitative results of minute changes in the patellar reflex may be elicited and recorded. M. J. ZIGLER (Princeton).

59. Berliner, A., Einfluss des Alters auf die Geschwindigkeit bei leichter Arbeit. *Z. f. angew. Psychol.*, 1924, 23, 196–204.

Es handelt sich um Ergebnisse, die bei der Auslese von Packerinnen in einer japanischen Fabrik gewonnen worden sind. Die Prüfung der Schnelligkeit der Handbewegungen wurde am Match Board, an einem Falttest und an einem Bretterpacktest vorgenommen. "Es gibt gewisse leichte Bewegungen, deren Geschwindigkeit eine Funktion des Lebensalters ist. Im allgemeinen zeigte sich uns, dass die Zeit bis ungefähr zum 20. oder 21. Jahr (japanische Altersberechnung) abnimmt und dann fortgesetzt wieder ansteigt." H. Bogen (Berlin).

60. Blumenfeld, W., Taylorsystem und schwere Muskelarbeit. *Z. f. angew. Psychol.*, 1924, 23, 207–209.

Kritische Bemerkungen zu einer gleichnamigen Arbeit von Doevenspeck, in denen nachgewiesen wird, dass ein Teil der gegen Taylor und sein System gerichteten Folgerungen als nicht genügend gestützt anzusehen sind. H. Bogen (Berlin).

61. Braden, S. R., An Extensive Experiment in Motor Learning and Re-Learning. *J. of Educ. Psychol.*, 1924, 15, 313–315.

An experiment in ball-tossing was devised to study the efficiency of motor learning. The apparatus consisted of a box eight inches high with a five-inch circular hole in the top as a target. Balls of solid rubber fifteen-sixteenths of an inch in diameter completed the test material. The distance at which the ball was thrown was twelve feet. A daily record for 100 days indicates improvement characteristic or the learning curve. After a lapse of twenty-two months further tests for a period of eighteen days show an improvement over the preceding work. Six months and twenty days following the second period shows improvement beginning with the initial score, at the tenth day cuts the line of the second but winds up with an even better score than the other two. G. M. Michaels (Columbia University).

62. Donaldson, J. C., The Influence of Pregnancy and Lactation on the Weight of Adrenal Glands in the Albino Rat. *Amer. J. of Physiol.*, 1924, 68, 517–522.

This study finds that the adrenal glands of albino rats, which exhibit no visible signs of disease, undergo no increase in weight during pregnancy and lactation. Unmated female rats suffering from

gross pathological lesions and infections of the lungs and of the middle ear and mastoid cavity show an increment in weight of the adrenals, and pregnant rats suffering from such lesions and infections present a further increase in the weight of these glands. M. J. ZIGLER (Wellesley).

63. RIDDLE, O., Studies on the Physiology of Reproduction in Birds: XIX, A Hitherto Unknown Function of the Thymus. *Amer. J. of Physiol.*, 1924, **68**, 557–580.

Five birds presenting such abnormalities as producing eggs with yolks of normal size but deficient in shell and albumen, diminished fertility and restricted hatchability of eggs, etc., were found to have extremely small thymus glands. These abnormalities were all readily corrected by the oral administration of ox thymus. M. J. ZIGLER (Wellesley).

64. LEE, F. S., and ARONOVITCH, B., On Weichardt's Supposed "Fatigue Toxin." *Amer. J. of Physiol.*, 1924, **69**, 92–100.

In 1904 Weichardt advanced the claim that fatigue is occasioned not simply by the usually accepted fatigue products but by a more specific substance, a true "fatigue toxin," which he designated as "kenotoxin." The present study undertakes to test the validity of this claim. Animals were fatigued, the juices were then pressed out of the skeletal muscles, filtered, and injected into other animals or administered to excised muscles with the purpose of observing the effects induced. Cats were chiefly used as source of juices and guinea pigs as test animals. The injection of such juices into guinea pigs produces stupor, an inconstant effect upon respiration, a temporary drop in body temperature, and occasionally subsequent death. When administered to excised muscles, such juices effect a marked decrease in the working power of the muscle, both by reducing the working period and by decreasing the total work performed. All of the effects which are produced by injecting the fatigue juices thus obtained into other animals, and by administering them to excised muscle, are also obtained by the use of juices taken from nonfatigued animals. Thus the claim of Weichardt is not substantiated. M. J. ZIGLER (Wellesley).

65. Lee, F. S., Additional Data Concerning Weichardt's Supposed "Fatigue Toxin." *Amer. J. of Physiol.*, 1924, 69, 101–106.

In the foregoing study of Lee and Aronovitch the muscle juices of fatigued cats were pressed out, filtered, and injected into guinea pigs as test animals to note the effect of such juices upon the behavior of the animals. In order to obviate the criticism that the results mentioned there may have been induced by the injection of foreign proteins into the guinea pigs, a series of experiments was performed in which the guinea pig served both as source of fatigued animal juices and as test animal. The general results of injection under these conditions are precisely the same as those in the foregoing study, and again the results of injecting the juices of nonfatigued guinea pigs into other pigs produce all the effects that are secured by the use of "fatigued" juices. Thus the results of the foregoing study are extended and validated. M. J. Zigler (Wellesley).

66. Bulatao, E., and Carlson, A. J., Contributions to the Physiology of the Stomach: Influences of Experimental Changes in Blood Sugar Level on Gastric Hunger Contractions. *Amer. J. of Physiol.*, 1924, 69, 107–115.

Using gentle dogs with gastric fistulae, and recording the gastric movements by means of the balloon and water manometer, it was found that intravenous injection of glucose inhibits normal gastric tonus and hunger contractions in normal dogs. The injection of insulin gives a definite gastric hypertonicity and hypermobility. Glucose and insulin have thus an opposite influence upon the gastric tonus of the stomach. In the diabetic dog insulin at first inhibits gastric tonus and hunger contractions, and gastric tetany does not appear until later. Glucose fails to inhibit hunger contractions in the diabetic dog when not under the influence of insulin. M. J. Zigler (Wellesley).

67. Kleitman, N., and de Kleijn, A., The Influence of Asphyxia on Vestibular Nystagmus and an Attempt to Localize the Seat of this Influence in the Reflex Arc. *Amer. J. of Physiol.*, 1924, 69, 160–168.

Asphyxiation of rabbits produces a deviation of both eyes in the same direction. If asphyxia is induced during vestibular nystagmus, which is occasioned by continuous irrigation of one ear by cold water, the nystagmus is at first stimulated until the quick component disap-

pears entirely, after which there is a reversal of the deviation. Results are produced which indicate that the motor eye phenomena do not originate from stimulation of the motor nucleii but are of medullary origin. M. J. Zigler (Wellesley).

68. Gruber, C. M., Studies in Fatigue: XIV, The Effect of Adrenalin on the Duration of the Latent, the Contraction and the Relaxation Periods of Skeletal Muscle at Rest and Undergoing Fatigue. *J. of Pharmacol. and Exper. Therapeut.*, 1924, **23**, 335–352.

A marked decrease in latent and contraction periods, especially in the early contractions, followed the adrenalin doses which lengthened the latent period after many contractions by as much as 257 per cent. D. A. Laird (Colgate).

69. Myerhof, O., Lactic Acid and Muscle Contractions. *Klin. Wochenschr.*, 1924, **3**, 392–394.

Lactic acid formation starts immediately upon beginning of muscle contraction, continuing so long as the tension increases; amount formed parallels the increasing tension. Rigor mortis occurs when lactic acid concentration passes a certain point. D. A. Laird (Colgate).

70. Vaucleroy, Action of Muscle Extract. *Comt. Rend. Soc. Biol.*, 1924, **90**, 377–378.

Muscle extracts had a stimulating effect upon fatigued frog muscle. D. A. Laird (Colgate).

71. Tuttle, W. W., The Effect of Alcohol on the Patellar Tendon Reflex. *J. of Pharmacol. and Exper. Therapeut.*, 1924, **23**, 163–172.

Whiskey and synthetic gin augmented this reflex in nine subjects who drank occasionally and had a depressing effect in two subjects who were accustomed to drinking daily. No effect in one other subject. D. A. Laird (Colgate).

6. ATTENTION, MEMORY, AND THOUGHT

72. Cutsforth, T. D., Synesthesia in the Process of Reasoning. *Amer. J. of Psychol.*, 1924, **35**, 88–97.

The reasoning processes of a blind synesthetic subject are reported and compared with those of a check observer. In the blind subject

synesthetic imagery is an invariable and an essential component in the development of meaning. Logical steps in the process of reasoning develop by means of problem-forms and the shifting of synesthetic coloration in these forms. The only structural criterion of reasoning is a uniformity in the use of schemata, while the functional criterion consists in the application of a concept to a present problem. Functionally the procedures of the synesthetic and asynesthetic subjects are alike, but they differ in the imagery used. Synesthesia is not an extraneous form of imagery but is a mechanism in the normal development and use of meaning which is essential to the cognitive activities of the subject who possesses it because it is the only structural tool he has for comprehending meanings. G. J. Rich (Pittsburgh).

73. Cady, H. M., On the Psychology of Testimony. *Amer. J. of Psychol.*, 1924, **35**, 110–112.

Students in a number of classes were tested as to their reports upon the actions of a man making an announcement to them. The tests consisted of narrative or answers to questions, or both. A large number of types of answers and reports were obtained. The variability of the reports seemed to be due to variations in the quality of the observation, in the strength of memory, and in ability to recount the details. More details were omitted in the narratives than were reported. The most satisfactory results were obtained by combination of the narrative and question-answer methods. G. J. Rich (Pittsburgh).

74. Dewey, D., and Dallenbach, K. M., Size *vs.* Intensity as a Determinant of Attention. *Amer. J. of Psychol.*, 1924, **35**, 121–125.

An experimental investigation was made of the relative intensity required of two spots of light of different size in order to produce equal clearness. A large space error was found to exist. When the effect of the space error was eliminated by averaging or by comparing under identical conditions different sized areas, the effect of size was shown to be definite and positive. Size is to be regarded as a condition of clearness and a determinant of attention. G. J. Rich (Pittsburgh).

75. Prang, M. D. H., Color Hearing. *Science*, 1923, **58**, 421–422. G. J. Rich (Pittsburgh).

76. Cason, H., The Concept of Backward Association. *Amer. J. of Psychol.*, 1924, **35**, 217–221.

The results obtained by Ebbinghaus which indicate that backward associations are formed are probably due to slips in attention during the learning of series of nonsense syllables. If, between the pronunciation of a syllable and the following one, the learner should think that he had just given the preceding syllable, an association would be formed in the reverse direction. It is likely that a condition of this occurred a sufficient number of times to give the small percentage of saving found when relearning a series in the backward order. Moreover, the law of forward direction across the synapse precludes the possibility of backward associations. G. J. Rich (Pittsburgh).

77. Robinson, E. S., and Darrow, C. W., Effect of Length of List upon Memory for Numbers. *Amer. J. of Psychol.*, 1924, **35**, 235–243.

Series of 4, 6, 8, or 10 three-place numbers were learned and tested after fifteen minutes for retention. The curves for learning are similar to those found for nonsense syllables in that they show negative acceleration and that in the shorter the list the more rapidly does learning proceed in its early stages. The percentages of each series learned in selected portions of the total time required for learning practically coincide except for the series of four numbers. The time required for memorization increases at an increasing rate as the lists become longer. The rate of forgetting tends to vary inversely as the length of the series. Susceptibility to retroactive inhibition decreases with increase in the length of the list. G. J. Rich (Pittsburgh).

78. Ernst, J. L., Smith, F. E., Moessner, L. R., Rudisill, E. S., and Atwater, M. J., Further Data for an Associative Limen. *Amer. J. of Psychol.*, 1924, **35**, 255–261.

The strength of the associative tendency, as measured by the method of right associates, was determined for five numbers of repetition with constant rate of presentation and for five rates of presentation with constant number of repetitions. The data is presented in "mnemometic" functions (analogous to psychometric functions), which show the relation of strength of associative tendency to the variable condition. A number of mathematical hypotheses were then tried out as means of computing association limens from the crude

data, and the adequacy of the various hypotheses to the observed functions tested. It was found that, of the hypotheses tried, a combination *phi-gamma* and square-root hypotheses was most adequate to the functions for variable numbers of repetitions, and that the *phi-gamma* hypotheses applied to the time per unit read was most adequate to the functions in which rate of presentation was the variable. G. J. Rich (Pittsburgh).

79. Fineman, A. E., and Ruderman, S., Constant *vs.* Accelerated Speed in Learning. *Amer. J. of Psychol.*, 1924, **35**, 261–263.

The observers in this study learned series of nonsense syllables either at one of four constant rates of presentation or at a rate which was increased by a constant increment from one repetition to the next, and the strength of the resulting associative tendency was tested by the method of right associates. With the speeds of presentation used (between one and two syllables per second), the constantly accelerated speed of presentation did not produce in four repetitions as great an amount of material learned in proportion to time expended as did certain of the constant rates of presentation within the same range. G. J. Rich (Pittsburgh).

80. Burke, R. S., and Dallenbach, K. M., Position *vs.* Intensity as a Determinant of Attention of Left-Handed Observers. *Amer. J. of Psychol.*, 1924, **35**, 267–269.

The brightnesses of two tachistoscopically exposed spots of light were equated so as to give equal clearness. The variable occurred in eight positions around the standard. For one observer who was of pure left-handed type, positions to the right were the most favorable, exactly the opposite of the results previously obtained for right-handed persons. In the case of the other observer, who was of an intermediate type and performed some operations with his right and some with his left hand, the positions to the left and above were most favorable. G. J. Rich (Pittsburgh).

81. Robertson, T. B., Consciousness and the Sense of Time. *Sci. Monthly*, 1923, **16**, 649–657.

A hypothesis of "mechanistic animism" is suggested in which the sense of time is made the most fundamental of human endowments, lying at the root of consciousness. The human cerebrum contains a time-machine whereby the space-time reality of the physical universe

is intersected along the time-axis and nowhere else. J. F. Dashiell (North Carolina).

82. Reiser, O. L., The Structure of Thought. *Psychol. Rev.*, 1924, 31, 51–73.

The author discusses the structure of thought under three headings: (1) Logical, (2) Psychological, (3) Physiological. The logical part of the paper follows Bertrand Russell and the neo-realistic reduction of thinking to terms and relations. In the psychological part the structural and functional treatments are discussed, and a few remarks are added upon the phenomenology of thought. In the physiological part the behavioristic reduction of thought to incipient movements of the vocal musculature is presented and criticized; several objections are raised. P. T. Young (Illinois).

83. Roffenstein, G., Das Problem des Unbewussten. *Kleine Schr. z. Seelenforsch.*, 1923, 5.

Eine ausführliche Darstellung und Kritik der hauptsächlichen Theorien vom Unbewussten. Der Verfasser findet in keiner Theorie eine befriedigende Lösung, erwartet aber eine solche in einer Methodik, die sich der Freudschen Ergebnisse bedient, kritischer und exakter vorgehtals diese, etwa im Sinne von Külpe und Ach. Inbetracht käme hier die Selbstbeobachtung an experimentellen Bewusstseinserlebnissen, die Ausfragemethode usw. P. Plaut (Berlin).

84. Sterzinger, O., Zur Prüfung und Untersuchung der abstrakten Aufmerkssamkeit. *Z. f. angew. Psychol.*, 1924, 23, 121–161.

Die Abstreichversuche im Sinne von Bourdon-Whipple welche ein Durchstreichen immer wieder der gleichen Elemente verlangen, prüfen die sinnliche Aufmerksamkeit. St. konstruierte Durchstreichtests deren Aufmerksamkeitsverhalten dem des geistigen Arbeiters entspricht. Er lässt durch ihre Stellung in irgendeiner weise ausgezeichnete Buchstaben aus sinnlosen Komplexen abstreichen. Davon werden alle Buchstaben des Alphabets betroffen; da ferner der Prüfling gleich auf nach verschiedener Suchregel zu bearbeitende Buchstabenelemente gerichtet wird, gelingt ihm die gute Lösung des Tests nur dann, wenn er die Mehrheit der zu beachtenden Regeln fortdauernd im Blickfeld der Aufmerksamkeit arbeitsbereit halten kann. Die Tests wurden an Kindern und an Erwachsenen ausgeprobt. Die vorliegende Untersuchung geht weniger auf eine

statistische Eichung aus, als auf eine qualitative Analyse der bei der Erledigung der Arbeit auftretenden psychischen Phänomene. Die gute Lösung des Tests hängt davon ab, 1. dass die geistige Energie in erforderlichem Ausmasse der Arbeit zugewendet wird, 2. dass brauchbare, allen Fällen der Aufgabe ebtsprechende Leitgebilde erzeugt werden, 3. dass Teilinhalte leicht erzeugt, reproduziert, festgehalten und wiedererkannt werden, 4. dass Kontiguitätsassoziation rasch und von hinreichender Festigkeit entstehen, das 5. der Akt des Sich-Besinnens leicht vor sich geht.—Der Verf. sieht im Zusammenwirken dieser Funktionen die wesentlichsten Merkmale abstrakter Aufmerksamkeitsleistung.—Durch Wechsel in der Reihenfolge der Aufgaben wurde festgestellt, welche Art Arbeiten hemmend bezw. fördernd auf eine folgende einwirken. Die Korrelation zwischen diesem Test und dem nach Bourdon-Whipple beträgt $r = 0.48$ für die jüngeren Versuchspersonen und 0.37 für die älteren. Die Korrelation mit den Schulleistungen ist $r = 0.57$. Die Rangreihenkonstanz erweist sich als gut. H. Bogen (Berlin).

85. Kochmann, R. Über musikalische Gedächtnisbilder. Erste Mitteilung. Experimentelle Untersuchungen an Schülern. *Z. f. angew. Psychol.*, 1924, **23**, 329–351.

Es wird der Versuch eines Nachweises akustischer Anschauungsbilder gemacht, wie sie auf dem Gebiet des Optischen durch die Untersuchungen über eidetisches Sehen bekannt geworden sind. Es wird festzustellen versucht, ob sich aus dem Kriterium der Deutlichkeit bezw. Undeutlichkeit eine Scheidung der akustischen Gedöchtnisbilder in Anschauungsbilder und Vorstellungsbilder ergibt. Versuchspersonen waren 10–17 jährige Schüler verschiedener Schulgattungen, die einzelne Töne, Tonreihen, Zwei und Dreiklänge nach längeren Zeiträumen zu wiederholen hatten und zwar so, dass vor die Reproduktion früher eingeprägter Gebilde die Einprägung anderer Tongebiide geschaltet wurde. Subjektive akustische Gedächtnisbilder sind in der untersuchten Altersstufe sehr häufig. Sie erhalten sich bis zu 30 Minuten, sind aber äusserst labil. Die akustischen Gedächtnisbilder werden immer im Kopf, niemals ausserhalb der Versuchspersonen lokalisiert. Eine eindeutige Differenzierung in Anschauungs- und Vorstellungsbilder gelang in den vorliegenden Versuchen nicht; es wurde auch keinerlei objektives Kriterium für die Erkennung akustischer Anschauungsbilder gefunden. Im allgemeinen hängt die gute Reproduktion der Gedächtnisbilder mit

der musikalischen Begabung, mit Gewöhnung an das Hören von Musik und mit der Geübtheit im Singen zusammen. H. BOGEN (Berlin).

86. LUNDHOLM, H., A Comparative Study of "Creative Imagination" in Normal People and in Mentally Diseased. *Amer. J. of Psychiat.*, 1924, 3, 739–756.

A normal group and an abnormal group of men and women were shown on a screen a meaningless picture, with the suggestion that it was meaningful. They were asked to report what they saw, and their replies were carefully sorted for significant and nonsignificant answers, to determine their capacity for "creating images." From the normal group emerged a type, the "normal talkative," who said many words, but few significant ones. Of this group the men showed a slightly greater capacity for "creating images" than the women. Among the manic-depressive manics there was a larger number of significant answers than among the normal; among the manic-depressive manics, fewer significant words than the normal. Both recovering manics and depressives approach the normal talkative types. Results from dementia precox and psychopaths were unreliable. A. L. GOULD (Boston Psychopathic Hospital).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

87. HORTON, W. M., The Origin and Psychological Function of Religion According to Pierre Janet. *Amer. J. of Psychol.*, 1924, 35, 16–52.

A summary is given of Janet's lectures on the "*Evolution of Moral and Religious Conduct.*" Moral-religious conduct is conceived as a dynamic type of conduct which has as its function the control of other functions for the conservation of mental energy. It springs spontaneously from imitation at the level of social action. At the level of elementary intelligence, leading and following become specialized functions and moral-religious conduct shows the characteristic phenomena of order and command. At the next stage of development rites and myths appear as the inevitable expression of the beginnings of will and belief. Only when behavior reaches the reflective level does the god-idea enter and true religion commence. As language develops, thought appears. With thought comes the idea of human spirits, leading, through conduct with respect to the

dead, to the idea of god-spirits. From this point of view such phenomena as the loss and restoration of faith, fanaticism and proselytism, demonic possession and ecstasy can be understood. The god-idea is a result of synthetic action. Analysis tends to destroy religious faith. Religion has, however, had a profound influence upon morality and logic. In the rational level of conduct there are forces which make for the destruction of religion: education, philosophy, the prevalence of explanatory principle and experimental science. With the break-up of religion substitutes appear such as psychotherapy, spiritualism, and erotic, social, political, moral, esthetic and philosophical mysticism. Religion is not likely to disappear rapidly, for men need it as a means of social stimulation through alliance and friendship with unseen powers. G. J. Rich (Pittsburgh).

88. Dunlap, K., The Utility of Social Nuisances. *Sci. Monthly,* 1923, 17, 193–205.

A number of organized propaganda would, if they were to succeed or prevail generally, be social nuisances; but as long as they are only partially successful they may have a utility in forwarding the very things they aim at obstructing or in accelerating the removal of evil conditions they represent. Examples are found in Christian Science, antivivisectionism, pacifism, fundamentalism, flamboyant evangelism, prohibition, college athletics, the yellow press, art censorship, Freudianism, fake character analysis, etc. J. F. Dashiell (North Carolina).

89. Burnham, W. H., Mental Hygiene and Habits of Thinking. *Ped. Sem.,* 1923, 30, 105–126.

One of the best means of developing integration of the personality is the use of the scientific method and the habit of reasoning with constant control by reference to the facts of experience. J. F. Dashiell (North Carolina).

90. Sikes, M. L., Musical Talent and the Left Hand. *Ped. Sem.,* 1923, 30, 156–161.

In teaching piano and organ for twenty-two years the writer has observed that unusually talented pupils play easily and by preference with the left hand. J. F. Dashiell (North Carolina).

91. Lurje, W., Mystisches Denken, Geisteskrankheit und moderne Kunst. *Kleine Schr. z. Seelenforsch.*, 1923, 4.

An einer Reihe moderne Kunstwerke der bildenden Künste wie der Dichtkunst wird gezeigt, wie oftmals das Kunstwerk aus einem mystisch-prälogischen Empfinden heraus geschaffen wird. Ja, der Verfasser steht auf dem Standpunkte, dass nur derjenige echte Kunstwerke schaffen kann, der wirklich des mystischen Erlebens fähig ist. P. Plaut (Berlin).

92. Singer, K., Vom Wesen der Musik. *Kleine Schr. z. Seelenforsch.*, 1924, 7.

Das Wesen der Musik wird auf Grund psychologischer Erörterungen sowohl von der Seite des Künstlers beleuchtet, also die Psychologie des musikalischen Talentes, als auch das Problem des Bewusstwerdens der Musik, also ein Beitrag zur Tonpsychologie. Das Wesen der Musik selber ist an unsere Wahrnehmung, an unser Bewusstsein gebunden; ihre Schönheit, ihr Reichtum liegen in der Seele des Aufnehmenden, in unseren eigenen Wahrnehmungen; diese werden ausserhalb des Subjektes erzeugh und innerhalb des Subjektes unbewusst gestaltet. Je nach Begabung, nach Wissen, Temperament, Erfahrung und Sinnesart werden wir Musik in unserem Ich als erlebt fühlen oder als unerlebt von uns weisen. Interessant ist auch das, was Singer über die Eigenseele der Instrumente zu sagen weiss; jeder Klang eines Organs trifft eine andere Seite unseres musikalischen Ich und erweckt eine andere, besondere seelische Teilempfindung. P. Plaut (Berlin).

93. Schay, R., Die jüdischen Intellektuellen. *Kölner Vierteljahrsh. f. Soziol.*, 1923, 3, 124–132.

Gemeinsam für die jüdischen Intellektuellen ist der Umstand, dass sie sich alle entweder mit dem Judentum als Ganzem oder mit dem Zionismus oder mit beiden beschäftigen. Gemeinsam ist ferner die abstrakte Idee der Menschheit; vielen ist noch der Gedanke einer besonderen Pflicht des Judentums an der Menschheit gemeinsam. Die Tatsache der überwiegenden Führerschaft Intellektueller in den revolutionären Parteien in Deutschland beruht darauf, dass die Judenemanzipation keine restlose Durchführung erfahren hat. Andrerseits hat die Entfremdung dieser Männer dem Judentum gegegenüber, welches sie nur in abtsrakter Vorstellung besassen, ja dessen Realität sie häufig leugneten, ihnen die Möglichkeit einer

Führerschaft in jüdischen Parteien genommen. Ist diese Isolation der soziopsychologische Grund für die Begeisterung an der Menschheit, so erklärt sich aus ihr gleicherweise das Verhalten den jüdischen Parteien gegenüber. Da die jüdischen Intellektuellen am deutschen Judentum in seiner empirischen Gegebenheit keinerlei Interesse haben, nehmen sie auch an seinen Parteikämpfen keinen Anteil. Völlig ausserhalb der Sphäre ihres Denkens und Fühlens liegt die Orthodoxie und der assimilatorische Liberalismus. Beide Richtungen haben für sie den Charakter bourgeoiser Rückständigkeit. P. PLAUT (Berlin).

94. DELACROIX, H., Les conditions psychologiques du langage. *Revue Philos.*, 1924, **97**, 28–66.

Probably a large part of language derives from the primitive attempt on the part of an individual to express the meaning of particular emotions not only for the benefit of others but also for his own clarification. Language has developed partly as a means for conveying thought but also, and more especially, as an instrument without which thinking in the strict sense of the term is impossible; language constitutes the first attempt at an organization of experience and can therefore be called the first science. Contrasted with the language of animals, that of human beings appears to be of a different order entirely. In the case of animals, symbols are attached invariably to certain objects—the association is purely mechanical. With human beings infinite variations and combinations are possible because of the fact that only human beings have what can be truly called intelligence. Intelligence should not be thought of as ability to adapt to novel situations, because such a conception would force us logically to attribute intelligence to the whole universe. Neither can intelligence be defined as the ability to make many associations: it is the kind rather than the number of associations which counts. Intelligence, then, is discrimination and the power of choosing among associations. It involves making generalizations, establishing relationships; and since these processes always must be present wherever there is any kind of organization of ideas, it can be seen that intelligence has always played a part in both art and religion. It is this human intelligence which is so much in evidence when a child realizes that everything can be named and from then on makes rapid progress in learning the language. With regard to the beginnings of language in the race we can only speculate, but as we have already seen they probably grew out of need for expressing and explaining emotions, and more

specifically, perhaps, developed out of the very cries of emotion themselves. One thing at least is certain, namely, that language concerns itself first with the concrete, but that the more it develops the better fitted it becomes to deal with abstract ideas. M. B. Pratt (Wellesley).

95. Smith, M., The Laundry Trade: II, Experiments with a Psychological Test. *J. Indust. Hyg.*, 1924, **6**, 14–19.

Use of McDougall dotting test with laundry workers showed most errors in afternoons, and when standing, findings confirmatory of the trend of their output. Two of the 107 workers had serious psychoneurotic symptoms. D. A. Laird (Colgate).

8. SPECIAL MENTAL CONDITIONS

96. Rizzolo, A., A Study of 100 Consecutively Recorded Dreams. *Amer. J. of Psychol.*, 1924, **35**, 244–254.

Upon classification the dreams fell into the following categories: dreams excited in whole or in part by sensory stimuli; dreams involving a carrying over of experiences and emotions from the waking state to the dreams; dreams motivated by simple desires; dreams motivated by repressed desires; dreams motivated by suppressed desires; dreams motivated by sex desires; dreams resulting in muscular movements; dreams involving the "higher" centers; and dreams showing confusion and absurdity. Examples of each class are cited. Only a small percentage of the dreams were absurd. Under conditions of fatigue, recordable dreams occurred a longer time after the beginning than they did under normal conditions. G. J. Rich (Pittsburgh).

97. Sumner, F. C., Core and Context in the Drowsy State. *Amer. J. of Psychol.*, 1924, **35**, 307–308. G. J. Rich (Pittsburgh).

98. Pawlow, I. P., The Identity of Inhibition with Sleep Hypnosis. *Sci. Monthly*, 1923, **17**, 603–608.

When the conditioned stimulus to the feeding reaction by the dog is continued with the absence of food for a sufficient length of time it is gradually inhibited. But it is further found that the long continued use of unaccompanied conditioned stimulus may produce drowsiness, then sleep. Furthermore, cases are met with in which

either inhibition or sleep may develop, also cases in which one may pass into the other. The conclusion drawn is that inhibition and sleep are identical processes, the only difference being that the former is a condition involving localized parts of the cortex while the latter involves all. Irradiation of inhibitory process is demonstrated experimentally with a series of cutaneous points, stimulations of which are previously all conditioned to feeding, and then these points are progressively inhibited. Hypnosis represents one of the different steps in the process of irradiation of inhibition over the hemispheres—a partial sleep; and analogous part-inhibitions in the dog's total motor response to food can be experimentally induced. Hypnosis is inhibition spread over the usually active points in special areas of the hemispheres. Sleep is inhibition irradiated over the whole area of active points of the hemispheres and even over some parts of the brain below the cerebral hemispheres. Experiments have established the conditioning of a bell sound to the feeding response in wild white rats in 300 trials, in the second generation of the same animals in a hundred trials, in the third generation in thirty, in the fourth generation in ten, and in the fifth in five. The results on the sixth generation are yet to be ascertained. J. F. DASHIELL (North Carolina).

99. MOORE, J. S., Some Defects in Psychoanalysis. *Psychol. Rev.*, 1923, **30**, 461–475.

Three psychoanalytical concepts—complex, libido, censor—are critically discussed with reference to the views of Jung, Hart, Tansley, Freud, Adler, Sidis, Trotter, and others. The term *psychergy* is suggested as a substitute for *libido,* with the meaning of the latter extended to include self-instincts, race-instincts, and community instinct. P. T. YOUNG (Illinois).

100. KUNDE, M. M., The Effect of Prolonged Fasting Followed by Realimentation on Gastric Secretion. *Amer. J. of Physiol.*, 1924, **68**, 389–396.

Two dogs with Pavlov pouches were subjected to fasting twenty-seven days in order to ascertain whether changes in the amount and concentration of gastric secretion occur upon realimentation. In both cases the amount of gastric secretion in the post-fasting period is relatively less than in the pre-fasting period. There was no increment either in amount or in acidity of the continuous gastric product

at any time during the fasting period over that which normally is secreted on an empty stomach under normal conditions. During realimentation, however, there is a slight increase in the continuous secretion, but a more marked augmentation of the continuous secretion takes place after breaking the fast. The so-called "psychic secretion"—increase of secretion due to the sight or odor of food—operated at no time during the fasting period. M. J. ZIGLER (Princeton).

101. TUTTLE, W. W., The Effect of Sleep upon the Patellar-Tendon Reflex. *Amer. J. of Physiol.*, 1924, **68**, 345–348.

Using the apparatus described in the foregoing article, uniform stimuli were automatically delivered to the patellar-tendon at regular intervals with the subject awake or in various stages of sleep. "It was observed that as a subject fell asleep the patellar-tendon reflex gradually decreased, finally disappearing. Whenever the subject was sufficiently awake to readjust his posture the reflex returned, the degree of return depending upon the degree of wakefulness. When the sleep was interfered with by some external cause the reflex returned at once. When the awakening was spontaneous the reflex gradually returned to normal. There appears to be some degree of correlation between the reflex and the depth of sleep." M. J. ZIGLER (Princeton).

102. HASSIN, G. B., Brain Changes in Starvation. *Arch. Neurol. and Psychiat.*, 1924, **11**, 551–556.

The brain studied was obtained from the famine district of Russia. No structural changes were found, in the nerve elements or elsewhere. Degenerative changes were in the form of accumulation of lipoids in the ganglion cells, glia, and the blood vessels. Ganglion cell changes were similar to those found in the viscera of experimental animals. B. M. CASTNER (Boston Psychopathic Hospital).

103. FRIEDRICHS, T., Zur Psychologie der Hypnose und der Suggestion. Mit einem Vorwort von A. Kronfeld. *Kleine Schr. z. Seelenforsch.*, 1922, **1**.

Die Suggestibilität äussert sich in bestimmten archaistischen Erlebensweisen und Erlebensdispositionen und zwar im Sinne einer "Gläubigkeit" und ihrer "magischen" Symbolik; ihre Quelle ist affektiver Natur. Die suggestive Bindung ist in vieler Hinsicht

analog der Liebesbindung anzusehen. Die Suggestibilität wird genetisch begreifbar aus einer unbewussten Determinante: der triebbedingten ichlosen " suggestiven " Folgsamkeit des Kindes gegen die Eltern. Alle diese Momente zeigen eine weitgehende Analogie mit den Vorgängen, die bei der Hypnose stattfinden. Hypnotisch besonders zugänglich sind Astheniker im weitesten Sinne, Sensitive und Zwangsneurotiker, Imbezille; ferner aber auch Menschen mit der Neigung zum Durchbruch hysterischer Mechanismen; denn auch die hysterischen Mechanismen sind Archaismen wie die Suggestibilität. P. Plaut (Berlin).

104. Haas, W., Das Problem des Mediumismus. *Kleine Schr. z. Seelenforsch.*, 1923, 3.

Haas findet, dass die mediumistischen Tatsachen mit physikalischer Auswirkung von keiner anderen Struktur sind wie die normale Handlung mit physikalischem Enderfolg, nur dass die beteiligte psychische Komponente aus der Sphäre der Automatismen, des Unterbewussten stammt. Etwas Mystisches ist hier also nicht zu erblichen. Die psychologischen Phänomene des Mediumismus sind so wenig seltsam, dass grade in ihnen das Psychische zu sich selbst zurückkehrt und in sich selbst bleibt und zeigt, wie es ohne sinnlich anschauliche Bindung ist. P. Plaut (Berlin).

105. Vleugels, W., Zu Freuds Theorie von der Psychoanalyse. Schluss. *Kölner Vierteljahrsh. f. Soziol.*, 1923, 3, 170–175.

Behandelt wird hier Freuds Libido-Begriff und die soziale Beziehungslehre im Verhältnis zur Psychoanalyse. Es wird erneut darauf hingewiesen, dass die von Freud vereinfachte Trieblehre für die Erkenntniszwecke der Soziologie nicht ausreicht; die beiden Sammelbegriffe: Ich-und Sexualtrieb vermögen keine Analyse des sozialpsychischen Geschehens zu geben, ebensowenig, wie die ältere Gegenüberstellung eines Selbsterhaltungs- und eines Gattungstriebes. Was die soziale Beziehungslehre als empirische Soziologie von der Psychologie, die sie zur Unterlage ihrer Analyse machen könnte, fordern muss, sind nicht verallgemeinernde Konstruktionen auf der Grundlage ausgewählter Tatsachen, sondern streng logische Deutungen eines möglichst umfangreichen und gesicherten Materials. Damit soll nicht die Psychoanalyse für die Soziologie abgelehnt werden, vielmehr nur ihre allzu einseitigen Begriffsapparate. P. Plaut (Berlin).

106. Bousfield, P., The Castration Complex in Women. *Psychoanal. Rev.*, 1924, 11, 121–143.

The term "castration complex" has come to mean, not merely the fear of losing the phallus, but the desire to possess the phallus, the symbol of potency and superiority. In this latter form it is often found in women; and many so-called feminine characteristics are really defenses against it. The most significant of these defenses are: denial of all forms of sexuality in common with the male and regression to infantile modes of expression of the libido, exaggerated exhibitionism combined with excessive sexual modesty, and other *feminine* traits. If the complex is nearer consciousness, the reverse may take place, that is, the woman in question may imitate the male.

The characteristics of the woman who does not suffer from a strong castration complex lack in many respects so-called feminine qualities. "She frequently lacks those infantile characteristics to which we have referred, her exhibitionism is far less obtrusive, her interests, business, and appearance may often be termed of the masculine type, but would be far better termed of the adult type, since they are not defense reactions against the castration complex but sublimations of other normal infantile characteristics which have taken an unhampered course in their development." J. W. Bridges (Toronto).

107. Menninger, K. A., The Mental Effects of Deafness. *Psychoanal. Rev.*, 1924, 11, 144–155.

Loss of hearing produces in the individual a deprivation complex which results in a sense of inferiority. A compensation for this sense of inferiority is attempted by the organism as a whole. Such compensation may be satisfactory or unsatisfactory. Four types of satisfactory compensation, perceptual, intellectual, emotional, and volitional, are described. This is followed by a discussion of unsatisfactory compensations or adjustments. The writer finds that there are two common types: self-depreciatory, resulting in despondency and depression; and self-appreciatory, leading to the so-called paranoid attitude. In the former there is a painful realization of one's own inadequacy; in the latter there is a projection of this inadequacy or its cause upon the outside world. J. W. Bridges (Toronto).

108. Peck, M. W., Exhibitionism: Report of a Case. *Psychoanal. Rev.*, 1924, 11, 156–165.

This is a report of a case of compulsive exhibitionism. The patient was a man of high intelligence and good character. The perversion came on suddenly at about thirty years of age and continued intermittently for six years. After two months of psychotherapeutic study the patient gained control of his perversion and it has not since recurred. A sexual exposure at the age of six is suggested as a psychogenetic factor. This experience was repressed until certain environmental influences caused it to break through the resistance. J. W. Bridges (Toronto).

109. Stern, A., On the Counter-Transference in Psychoanalysis. *Psychoanal. Rev.*, 1924, 11, 166–174.

The writer points out that in psychoanalysis the transference positive or negative on the part of the patient often has its counterpart in a countertransference positive or negative on the part of the analyst. This creates a difficult situation which can be avoided only if the analyst acquires a better knowledge of his own unconscious processes and a better understanding of the phenomena of the transference. J. W. Bridges (Toronto).

110. Travis, L. E., Mental Conflicts as the Cause of Bad Spelling and Poor Writing. *Psychoanal. Rev.*, 1924, 11, 175–180.

"This study reports the case of a ten-year-old boy, normal physically and mentally, who, although doing fourth grade work in the majority of his subjects, could not spell a number of second grade words and could not equal the second grade writing standard. Analysis uncovered an incest fixation, a strong sexual curiosity, and a masturbation conflict. When these were dissolved, several indicative words, which were invariably misspelled at the beginning of the analysis, were spontaneously spelled correctly and insight was gained by the patient in regard to the nature of his poor handwriting, which was evidently a masturbation substitute." This study suggests that the commonly accepted laws of learning are inadequate and must be supplemented by psychoanalytic considerations. J. W. Bridges (Toronto).

111. Willey, M. M., Sleep as an Escape Mechanism. *Psychoanal. Rev.*, 1924, 11, 181–183.

This study reports the case of a boy twenty-four years of age who in his senior year in college developed an uncontrollable tendency to sleep most of the time. Analysis showed that the sleep was a means of escaping from the torment of an unsolved conflict in his love life. The solution of this conflict resulted in the disappearance of the symptom. J. W. Bridges (Toronto).

112. Rakestraw, N. W., and Whittier, F. O., The Effect of Loss of Sleep on the Composition of the Urine. *Proc. Soc. Exper. Biol. and Med.*, 1923, 21, 5–6.

Possible increase in total nitrogen and phosphorus of urine and lactic acid and phosphorus in the blood of eight subjects after forty-eight-hour loss of sleep. D. A. Laird (Colgate).

9. NERVOUS AND MENTAL DISORDERS

113. Bailey, P., A Contribution to the Study of Aphasia and Apraxia. *Arch. Neurol. and Psychiat.*, 1924, 11, 501–539.

A comprehensive study of two cases of metastatic tumor of the left hemisphere, which confirm the deductions of Pierre Marie and Foix drawn from the study of war wounds of the aphasic area. From the point of view of psychology, certain of the author's observations appear significant in connection with recent theories of the mechanism of thought as consisting of minimal speech-movements. Lesions in the cortical area for the face and throat are found to cause not only facial paresis, and difficulty in motor speech, but to result as well in difficulty in reading, writing, and in so complex a thought process as calculation. B. M. Castner (Boston Psychopathic Hospital).

114. Wilson, G., and Winkelman, N. W., Partial Continuous Epilepsy, with Especial Reference to That Produced by Microscopic Cortical Lesions. *Arch. Neurol. and Psychiat.*, 1924, 11, 530–542.

It is usual to attribute partial continuous epilepsy in a patient to some more or less gross lesion of the brain, such as tumor, abscess, subdural or extradural hemorrhage. Two cases are here described in which this diagnosis, appearing perfectly logical, was made, but was proved incorrect by operation and necropsy. The cases show that

partial continuous epilepsy may be due to microscopic lesions in the cortex. Pathologic study showed that a great many cells were unaffected, and that chances for recovery were, to some extent, good. When an encephalitis patient recovers, he will frequently have epilepsy, and perhaps jacksonian attacks. Probably the most common cause of jacksonian epilepsy is idiopathic epilepsy, and the authors believe that it is in this type of case that the so-called inside jacksonian fit often occurs. B. M. CASTNER (Boston Psychopathic Hospital).

115. WEISS, S., and KENNEDY, F., Clinical Experiments in Myotonia Congenita (Thomsen), with Especial Reference to the Parasympathetic Nervous System. *Arch. Neurol. and Psychiat.*, 1924, **11**, 543–550.

"These observations afford no evidence that the disease is primarily of muscular origin, but they point toward the fact that it is due to an abnormally increased activity of the parasympathetic nervous system which normally regulates the tone of striated muscles. The administering of thyroid substance and thyroxin exerted the same sensitizing action on the effect of atropin in this case that they exert on the effect of epinephrin in normal individuals. This suggests that the thyroid secretion is a sensitizing agent for both the sympathetic and the parasympathetic systems." B. M. CASTNER (Boston Psychopathic Hospital).

116. FRAZIER, C. H., and RUSSELL, E. C., Neuralgia of the Face: An Analysis of 754 Cases with Relation to Pain and Other Sensory Phenomena Before and After Operation. *Arch. Neurol. and Psychiat.*, 1924, **11**, 557–563.

A study, from the clinical standpoint, of the pain phenomena before operation, and the sensory distortions after operation, in major trigeminal neuralgia ("tic douloureux," "epileptiform neuralgia"), and in the other so-called "atypical" forms of neuralgia. An analysis of sixty atypical cases forms a basis for a differential diagnosis of the typical and atypical forms. B. M. CASTNER (Boston Psychopathic Hospital).

117. WALKER, J., Basal Metabolism in Mental Disorders, Especially Dementia Precox, and the Influence of the Diathermic Current on the Same. *J. of Ment. Sci.*, 1924, **70**, 47–58.

The determination of the metabolic rate assists in a better understanding of cases of mental disorder in which thyroid disturbance may

be an important factor. Of cases of dementia precox examined, 50 per cent showed a subnormal basal metabolism, the average rate being 20 per cent less than normal. No material change followed the administration of thyroid. During remission in the course of dementia precox the metabolic rate approaches normal. In mental cases other than dementia precox there was no deviation from normal basal metabolic rate, except in one case where there was clinical evidence of hyperthyroidism. The heat produced by the diathermic current is endogenous, and has increased the basal metabolism on the average of 10 per cent to 15 per cent in all cases so treated, the intensity of the reaction varying with the duration of the treatment. A. M. JONES (Pennsylvania).

118. STEWART, R. M., General Paralysis: Its Unsolved Problems. *J. of Ment. Sci.*, 1924, 70, 33–47.

After presenting in a brief paragraph a summary of the manifold problems, still unsolved, of general paralysis, the paper is restricted to the rather comprehensive discussion of two of these problems—the time of invasion of the nervous system in paresis, and the question of the existence of special neurotropic strains of the spirochete pallida. A. M. JONES (Pennsylvania).

119. GILLESPIE, R. D., Epidemic Encephalitis: Some Psychical Sequelae. *J. of Ment. Sci.*, 1924, 70, 1–24.

An analysis of ten cases, eight of which show sequellae of epidemic encephalitis and two of encephalitis of sporadic origin. Cases are considered singly and in groups under the headings: Emotional Reactions, Volitional Disorder, Trend Reactions, Delirium, Intellectual Functions, Sleep, and Physical Aspects. Diagnosis and prognosis are considered, and conclusions are presented concerning the general nature of the psychical sequellae of encephalitis. A. M. JONES (Pennsylvania).

120. BEATON, T., The Psychogenic Factor in the Causation of Mental Disorder. *J. of Ment. Sci.*, 1924, 70, 58–68.

After an introduction concerned with a discussion of the mind and body problem, the author points out the recent convergence in psychiatry of two lines of thought—the physiogenic and the psychogenic, and indicates the error of considering the two as separate entities. " So soon as we realize that the psychological description of

mental phenomena must have a correlation in nervous function, we are saved from many dangers which lie around any attempt to solve the problem of life by any purely psychological means." He stresses the essential unity of the processes which we view from the two aspects of mind and brain, and regards the psychogenic factor as differing from the physiogenic not absolutely, but rather in the "complexity and generality" of the nervous activity involved. Psychogenic factors fall into the two groups—innate and acquired. The difficulty of finding adequate criteria for such differentiation is indicated, attention being directed especially to a critical discussion of the Freudian hypothesis. Two cases are presented to illustrate the difference between the form of the psychosis and the mental content. The paper is philosophical in tone, and was prompted by the manifold difficulties encountered in clinical practice when dealing with the psychogenic factor. A. M. Jones (Pennsylvania).

121. Kronfeld, A., Das seelisch Abnorme und die Gemeinschaft. *Kleine Schr. z. Seelenforsch.*, 1923, 6.

Zwei Grundfragen werden gestellt: Wie wirkt das Gemeinschaftsleben—als Ganzes oder in einzelnen konkreten Gestaltungen—in psychopathologischer Hinsicht auf den einzelnen? Liegen in den Formen des sozialen Lebens an sich schon abnormisierende Tendenzen und welcher Art sind sie? Wirken sie auch gestaltend und ausbeuend auf bereits vorhandene psychopathologische Strukturen? Zweitens: Wie wirken seelische Krankheit und Abartigkeit in die mannigfachen sozialen Gruppierungen und Formen des Gemeinschaftslebens hinein? Wirken sie nur zerstörend, bedrohend oder auch produktiv gestaltend? Die erste Grundfrage wird von Kronfeld bejaht: tatsächlich steht die einzelne Seele unter den abnormisierenden Wirkungen der sozialen Gebundenheit als solcher. Die Gemeinschaftsverbindung hat immer eine Tendenz zu psychischer Abnormisierung, insofern, als sich der einzelne niemals ohne Konflikt den Notwendigkeiten und Normen der Gemeinschaft assimiliert. Die Abnormisierung schafft überall dort, wo sie entweder einen besonders günstig individuellen Boden trifft, oder wo der Druck sozialer Bedingungen das Mass der Anpassungskraft des einzelnen akut oder dauernd übersteigt. Was die zweite Grundfrage betrifft, so wirken sich psychopathologische Einflüsse in starkem Masse in den Gemeinschaftsformen aus. Sie haben grade dort, wo sie produktiv—schöpferisch und nicht nur destruktiv in der Gemeinschaft auftreten, eine besondere Affinität

zum Massengeschehen, zur unbedingten, radikalen Gemeinschaftsverwirklichung einer Idee. P. PLAUT (Berlin).

122. DE SANCTIS, S., Hystero-psychopathische Kinder. *Monatsscher. f. Kriminalpsychol. u. Strafrechtsreform,* 1923, **14**, 269–286.

Hysterische Psychosen gibt es auch in der frühen Kindheit, bei ganz kleinen Kindern kaum echte hysterische Psychosen, aber hysterische Einzelsymptome. Bei Kindern wie Erwachsenen kommen folgende hysterische Psychosen vor: (1) Der hysterische Charakter allein oder in Verbindung mit episodischen depressiven Syndromen. (2) Der hysterische Charakter im deliranter Form; somnambule Einschläge, Dämmer-oder halbklare Traumzustände von längerer oder kürzerer Dauer. (3) Der hysterische Stupor bei Individuen mit hysterischem Charakter. (4) Hysterische Phänomene, verbunden mit anderen nervösen oder anderen Geisteskrankheiten, aber stets bei hysterischem Charakter. Der Unterschied bei hysterischen Psychosen von Erwachsenen liegt also: (1) in der Abwesenheit von Zeichen einer neuropsychopathischen Konstitution; (2) in der Tatsache, dass die hysterischen Psychosen der Kinder einförmiger sind als bei Erwachsenen. Therapeutisch erweist sich für Kinder die suggestive Psychotherapie als die wirksamste. Wesentlich aber ist die individuelle Erziehung und dementsprechende Gestaltung des häuslichen Milieus. P. PLAUT (Berlin).

123. MICHEL, R., Zur Psychopathologie der Spitalsbrüder. *Arch. f. Krim.,* 1924, **76**, 10–15.

"Spitalsbruder ist derjenige, der von Spital zu Spital wandert, seinen Spitalsaufenthalt tunlichst auszudehnen sucht und aus einem Spital entfernt, sofort seine Aufnahme in ein anderes zu erreichen bestrebt ist, kurz der das Kranksein zum Berufe macht." Bei einem Grossteil der Spitalsbrüder besteht ein hysterischer Symptomenkomplex auf dem Boden einer allgemeinen psychopatischen Degeneration. "Das Motiv, das die Spitalsbrüder zu solchen macht, ist Arbeitsscheu"; dadurch sind die Spitalsbrüder den Landstreichern verwandt und dadurch werden sie häufig kriminell. Unter dem Einfluss des Krieges wurde die Zahl der Spitalsbrüder vermehrt. Am meisten eine die aktionsfähigeren und bedürfnisreicheren Lebensalter beteiligt. Zur Prophylaxe wären schwarze Listen der erkannten Spitalsbrüder zu führen und bei allen Spitälern des weiteren Umkreises zu verbreiten. Kriminelle und aus Arbeitsscheu rückfällige

Spitalsbrüder sollten in Zwangsarbeitsanstalten interniert werden. O. Lipmann (Berlin).

124. Winkler, C., The Organization of Medical Education in Psychiatry and Neurology at the Dutch Universities, with Special Reference to the Neuro-Psychiatric Clinic at Utrecht University. *J. of Ment. Sci.*, 1924, **70**, 179–198.

A review of the organization of the study of psychiatry and neurology at the universities in Holland since the middle of the nineteenth century, with a detailed description of the development of the clinic at Utrecht University. A. M. Jones (Pennsylvania).

125. Hayes, E. D. T., Some Aspects of Dementia Precox. *J. of Ment. Sci.*, 1924, **70**, 208–217.

As probable etiology for dementia precox, the author presents the psychogenic factor of deep introversion and the physiogenic factor of endocrine deficiency. Lack of *interstitial* hormone appears as the most significant factor in the endocrine disorder. Research tends to show the secondary nature of introversion as an etiological factor. Further investigation of the results of the introduction of interstitial hormone into the circulation in dementia precox patients is in progress, and results will be submitted at a later date. A. M. Jones (Pennsylvania).

126. Middlemiss, J. E., Mental Trends and Mechanisms, and Their Relation to Disease Considered in Their More Familiar Manifestations. *J. of Ment. Sci.*, 1924, **70**, 217–224.

The author attempts to establish a logical relationship between the minor departures from mental health, and their culminating manifestation in an actual psychosis. A. M. Jones (Pennsylvania).

127. Riddel, D. O., and Stewart, R. M., Pressure Changes in the Cerebrospinal Fluid. *J. of Ment. Sci.*, 1924, **70**, 224–233.

This paper begins with a résumé of our information concerning the distribution and circulation of the cerebrospinal fluid, the methods of obtaining pressure readings, and normal variations in pressure under conditions of changed posture, and time of reading after puncture. In a paragraph are summarized significant findings concerning the pressure limits in healthy imbeciles, idiocy with gross brain disease, katatonic dementia precox, cerebrospinal syphilis, epilepsy, and

insanity with gross brain disease. The final section of the paper deals with observations on spinal drainage without lumbar puncture. The results of the intravenous injection of 30 per cent saline solution in the human subject are indicated, and charts are presented to show the effect of this treatment in three cases of general paralysis. A. M. JONES (Pennsylvania).

128. STRECKER, E. A., and WILLEY, G. F., An Analysis of Recoverable "Dementia Precox" Reactions. *Amer. J. of Psychiat.*, 1924, 3, 593–679.

A history and discussion of twenty cases of dementia precox which terminated in recovery is presented, with an analysis to determine what gave the malignant aspect, and to what factors may be attributed the subsequent benign aspect of the psychosis. Analysis does not extend to unconscious material; it is confined to interpretation of the race, history, personality, physical history before and after the psychosis, precipitating factors, and the nature of the onset, whether rapid or gradual, as well as the immediate nature of the psychosis. Some of the sources of error in prognosis are as follows: 1. Unfamiliar racial traits may be interpreted as malignant when they may rightly be habitual modes of response. 2. A history of mental disease in a parent may bias the interpretation of the psychosis in the offspring. 3. Frequently the favorable traits of the basic normal personality of the patient are underestimated. 4. Sensory disturbances as the residual of previous organic disease occasionally give a bizarre twist to the picture. 5. The precipitating situation may be underestimated in the strength of its affective features and its significance to the psychosis. A close connection between precipitating situation and psychosis may well indicate the essentially benign nature of the disease. 6. A stormy onset, usually a more favorable prognostic sign than a gradual, may give a too malignant cast. 7. Toxicity and exhaustion may be misinterpreted as deterioration. 8. Stupors, catatonic states, may be due to somatic factors, and therefore recoverable. A. L. GOULD (Boston Psychopathic Hospital).

129. HENRY, G. W., Some Roentgenologic Observations of Gastro-Intestinal Conditions Associated with Mental Diseases. *Amer. J. of Psychiat.*, 1924, 3, 681–695.

Observation was conducted on 100 unselected cases for six days to determine the frequency of pathological conditions associated with

psychoses. No general conclusions can be drawn. The study emphasizes the need of a more careful evaluation of conditions, regardless of mental state. Another series of observations was made on 100 cases to show that visceral position, tonus, and motility are affected by different types of psychosis, regardless of variability due to habitus. They were classified according to mental condition at the time of X-ray; and for "build" of the individual, weight, and tension of the abdominal wall. In the manic phase of affective psychoses there was a tendency towards normal position, hypertonic tonus, and normal motility; in the depressive phase, just the opposite. Involutional melancholia approximated the condition of the depressive state. Conditions were variable in dementia precox. Catatonic forms showed normal position, hypertonicity, and hypermotility; paranoid dementia precox the same, except for more marked hypomotility than in depressions. Paranoid states showed higher position, greater tonus, than dementia precox, and slight hypomotility. In the relation of gastrointestinal functions and psychoses there is too little evidence for considering either one the cause of the effect. In psychosis there are definite changes in the vegetative nervous systm; a psychosis is a change in the entire individual rather than merely an abnormal functioning of the brain or of the central nervous system. A. L. Gould (Boston Psychopathic Hospital).

130. Moersch, F. P., Psychic Manifestations in Migraine. *Amer. J. of Psychiatry,* 1924, 3, 698–716.

From 15 per cent to 26 per cent of migraine patients present at some time definite disturbance in the psychic sphere. Migraine has been found in association with transient manias, changes in personality, psychic equivalents, behavior disturbances, epilepsy, hysteria, and neuralgia. Although psychoses may be associated with migraine, it is rare for a psychosis to be precipitated by a migrainous attack. Etiology is undetermined, but there is doubtless a biologic factor. A. L. Gould (Boston Psychopathic Hospital).

131. Singer, H. D., Histopathology in Focal Brain Softening. *Amer. J. of Psychiatry.,* 1924, 3, 717–720.

A case is reported, with plates of the brain condition. There was complete necrosis of the nervous tissues in the center, occurring more rapidly in the white than in the gray matter. Tissue reactions involved the glia and mesodermal tissue. In the glia tissue there were

two kinds of change: (1) the development of cytoplasmic glia and *gitter* cells; (2) a development of glia fibers at the periphery of the lesion. In the mesodermic tissue there was an active fibrous proliferation and new vessel formation, with proliferation of lymphocytes. A. L. Gould (Boston Psychopathic Hospital).

132. Kelly, O. F., Acidophile Degeneration in Dementia Precox. *Amer. J. of Psychiat.*, 1924, 3, 721–738.

Acidophile degeneration was found in seven of a group of ten cases diagnosed as dementia precox. In the other three cases, two of the diagnoses were doubtful, and one at autopsy was found to be another condition. The presence of acidophile degeneration, on further investigation, may become a criterion for dementia precox at autopsy. The results are presented as added proof of the organic brain disorders in dementia precox. The experimenter discards tuberculosis and the method of tissue fixation in producing acidophile degeneration in cases of dementia precox. A. L. Gould (Boston Psychopathic Hospital).

133. Wright, G., Some Observations on the Treatment of the Psychoneuroses. *Amer. J. of Psychiat.*, 1924, 3, 757–766.

About 25 per cent of the cases coming to the office of a neurologist fall into the group of psychoneuroses. Many of these are benign, and do not require psychoanalysis in the strict Freudian sense. A thorough understanding of the patient, with a regulation of his régime, is effective in mental adjustment except in the more malignant cases. A. L. Gould (Boston Psychopathic Hospital).

134. Raphael, T., Jacoby, A. L., Harryman, W. W., and Raphael, M. M., Socio-Psychiatric Delinquency Studies from the Psychopathic Clinic of the Recorder's Court, Detroit. *Amer. J. of Psychiat.*, 1924, 3, 767–778.

Among the 1,988 offenders examined, high rates of psychiatric conditions and recidivism were found. The percentage of foreign offenders was low, that of male and negro offenders high. The results substantially support those of Glueck in Sing Sing and Anderson in Boston. A. L. Gould (Boston Psychopathic Hospital).

135. Rhein, J. H. W., and Ebaugh, F. A., Affective Disorders Following Acute Epidemic Encephalitis in Children. *Amer. J. of Psychiat.*, 1924, **3**, 791–799.

Psychoses following acute epidemic encephalitis in children are similar to those in adults. From a group of children showing neuropsychiatric manifestations at the clinic of the Philadelphia General Hospital the following observations were made: 1. Attempts at suicide were frequent but not motivated, and occurred generally in a condition of agitated insomnia. 2. Depressive states were transient, and there was almost no marked depression as seen in manic-depressive psychoses. 3. Frequently there was marked psychomotor activity and euphoria. 4. In children there is less frequently than in adults a relation between previous personality disorders and post-encephalitic disturbances. Because of the delinquent acts, sexual precocity, and suicidal attempts associated with the sequelae of the disease, it assumes marked medico-legal importance. A. L. Gould (Boston Psychopathic Hospital).

136. Brush, N. H., The Practitioner and the Diagnosis of General Paresis. *Amer. J. of Psychiat.*, 1924, **3**, 801–807.

Unless very painstaking and searching, a general practitioner may fail to detect paresis because of its simulation of many kinds of mental disorders. Essential features for history, physical examination, and mental status are suggested as leading to clues in cases baffling detection. Any memory defect, moral slump, or vague neurasthenic symptoms should lead to further inquiry. A. L. Gould (Boston Psychopathic Hospital).

137. Hamilton, S. W., Standardization. *Amer. J. of Psychiat.*, 1924, **3**, 809–816.

The paper presents a brief history of the growth of " standardization " in the care of the insane, dating from the organization in 1844 of the Association of Medical Superintendents of American Institutions for the Insane. A collaboration of the National Committee for Mental Hygiene and the American Psychiatric Association is suggested in setting standards which will improve hospital buildings, laboratory equipment, and staff management in state institutions. A. L. Gould (Boston Psychopathic Hospital).

138. Patten, C. A., and Ostheimer, A. J., A Study of the Interrelationship Between Endocrine Disturbances and Psychoneuroses with Clinical and Laboratory Findings. *Amer. J. of Psychiat.*, 1924, 3, 817–828.

In all the forty-eight cases studied the symptoms of the psychoneuroses were present. It is concluded that a psychoneurosis may or may not be interrelated with endocrine disturbances, and that endocrine disturbances are not necessarily coexistent with psychoneurotic symptoms. One does not originate the other. It may be that both conditions have a common starting point in a constitutional defect of the individual. Charts showing the interrelation of the many endocrine and psychoneurotic manifestations are included. A. L. Gould (Boston Psychopathic Hospital).

139. Saussure, R. de, Differentiation of Manic-Depressive Psychosis. *Encéphale*, 1924, 19, 73–82.

Adoption of the somatic types of Kretschmer is necessary for the progress of psychopathology, making it possible to determine fairly objectively whether an individual is cycloid or schizoid. D. A. Laird (Colgate).

140. Norbury, F. P., Seasonal Curves in Mental Disorders. *Medical J. and Rec.*, 1924, 119, 81–88.

Maximum mental admissions in spring months and persisting until summer, with minimum in November. The curves parallel the efficiency curves of Huntington. D. A. Laird (Colgate).

141. Minogue, S. J., The Intelligence of the Criminal Insane. *Med. J. of Australia*, 1924, 1, 407–410.

Psychotic criminals in Parramatta Mental Hospital indicate that those of superior intelligence were prone to murder while the low imbeciles tend to indecent assault and robbery. Stanford-Binet tests were used. D. A. Laird (Colgate).

10. INDIVIDUAL, RACIAL AND SOCIAL PSYCHOLOGY

142. Freyd, M., Introverts and Extroverts. *Psychol. Rev.*, 1924, 31, 74–87.

The terms "introvert" and "extrovert" may be defined as follows: "(1) Introvert: An individual in whom exists an exaggeration

of the thought processes in relation to directly observable social behavior, with an accompanying tendency to withdraw from social contacts. (2) Extrovert: An individual in whom exists a diminution of the thought processes in relation to directly observable social behavior, with an accompanying tendency to make social contacts." Descriptions of introversion and extroversion are given from Jung, McDougall, Nicoll, Allport, Kempf, Wells, and Kinkle; and data collected by the author are presented. The paper also contains a theoretical discussion upon the origin of introversion and extroversion. It concludes with the general question as to whether introverts and extroverts belong to types. P. T. YOUNG (Illinois).

143. KRONFELD, A., Ueber Gleichgeschlechtlichkeit. *Kleine Schr. z. Seelenforsch.*, 1922, 2.

Kronfeld versucht, das Wesentliche der gleichgeschlechtlichen Menschentypen mit der phänomenologischen Methode, erlebnismässig zu erfassen, freilich ohne die Bedeutung der biologischen Forschung ausser acht zu lassen. In der Hauptsache wird die Frage untersucht: Wie stellt sich das Selbsterelebnis des Anderssein in den Liebesintentionen beim gleichgeschlechtlichen Menschen wesensmässig dar? Vier Typen werden aufgestellt. (1) Ein Mann mit "männlichen" Liebesintentionen richtet diese auf einen Mann mit ebenfalls "männlichen" Intentionen und mit "männlichem" Leibe. Diese Form ist selten. (2) Wie Fall 1, nur, dass die Liebesintentionen auf einen Mann mit ebenfalls "männlichen" Intentionen, aber "weiblichem" Leibe gerichtet sind. Solche Form findet sich etwa in den Platonischen Dialogen. (3) Ein Mann mit "männlichen" Intentionen richtet diese auf einen Mann mit "weiblichen" Intentionen und "männlichem" Leibe. (4) Ein Mann mit "weiblichen" Intentionen richtet diese auf einen Mann mit "männlichen" Intentionen und "männlichem" Leibe. In dieser letzten Gruppe stehen die Homoeroten femininer Prägung, welche den echten Mann lieben. Kronfeld betrachtet das Problem auch von der soziologischen Seite und weist darauf hin, dass der gleichgeschlechtliche Eros ein starker ethisch-soziologischer Motor ist, was besonders bei der modernen Jugendbewegung zu erkennen ist. Kronfeld sieht hier das Ziel einer Neubegründung des Hellenismus mit seiner schöpferischen, individuellen Kultur. P. PLAUT (Berlin).

144. Hirsch, G., Persönlichkeit und Masse in der gegenwärtigen Kulturlage. *Z. f. päd., Psychol. u. exper. Päd.*, 1922, 23, 409–421; 1924, 25, 101–117.

Der Prozess, der die Entstehung des Massengedankens herausarbeitet, ist durchaus individueller Natur. Auch wenn der Einzelne die Gesamtheit, die Masse nicht als Basis und Fundament seines individuellen Wertes, seines Strebens anerkennt, so sucht er doch, Einfluss, Bedeutung zu erlangen; er bemüht sich um " Beziehungen," er will " Schule " machen. Der neuzeitliche Mensch hat nicht wie etwa der Mensch der Renaissance die Gemeinschaft um und hinter sich, sondern eine entpersönlichte Masse vor sich. Sie ist ihm persönlich ausserordentlich gleichgültig, weshalb er rücksichtslos mit ihr verfährt, wenn er ihrer auch bedarf. Deshalb muss er bemüht sein, alle offenen Zusammenstösse zu vermeiden, damit er nicht in den Hintergrund gedrängt wird. So steht also die Persönlichkeit zur Masse in einem sehr labilen Verhältnis, bald sich ihr nähernd, bald sich von ihr entfernend. Das Individuum als Persönlichkeit sieht in sich das eigentlich handelnde Prinzip des Gesamtheitslebens, die wirkende Kraft der toten Masse, deren physische Kraft das Mittel wird, sein geistiges Leben zu beleben, ihm Ausdruck und Wirklichkeit zu verleihen. P. Plaut (Berlin).

145. Lang, R., und Hellpach, W., Gruppenfabrikation. *Sozialpsychol. Forsch.*, 1922, 1.

Es handelt sich hier um den Versuch, innerhalb eines Maschinenfabrikationsbetriebes durch besondere Einteilung der Werkstattseinrichtung eine grössere Uebersichtlichkeit zu erreichen und an Transport zu sparen. Das Fabrikproblem ist ein Werkraumproblem, an dem man eine quantitative und qualitative Raumfrage unterscheiden kann. Bei der ersten Frage erscheint die Fabrik als massenversammelnder Werkraum, bei der zweiten handelt es sich um die Art und Weise des Werkes, mit welchem der Werkraum erfüllt wird: die werkräumliche Verteilung dieses Werkes, der Werkdinge und der Werkmenschen. Untersucht werden im einzelnen: der Motivschwund und Motivrest in der Fabrikarbeit, das Lohnmotiv und Lebensideal des Fabrikarbeiters, die Tragweite des Fabrikproblems, die psychologischen Wirkungsgrenzen betriebstechnischer Reformen, die psychologische Fragestellung an die Gruppenfabrikation, der Eindruck der Gruppe auf den Arbeiter, der psychologische Wert der Werkstattzeichnung, die werkpädagogische Zielsetzung, das

Gruppenprinzip in Lehre und Fortbildung, die Gruppenfabrikation und Arbeitsteilung. Die Arbeit ist für die Massenpsychologie von weitragender Bedeutung. P. Plaut (Berlin).

146. Rosenstock, E. (in Verbindung mit E. May und M. Grünberg), Werkstattaussiedlung. *Sozialpsychol. Forsch.*, 1922, 2.

Werkstattaussiedlung bedeutet die Schaffung eines neuen Lebensraumes, neuer Lebensformen der in einer Fabrik gruppierten Menschen. Der Aussiedlungsbetrieb baut auf den Errungenschaften der Grossindustrie und der Arbeiterbewegung auf. Er zeigt einen Ausweg aus gewissen technischen Nöten der Industrie. Er verbindet die Eigenschaften des Grossunternehmens in Sachen der Schulung, der Landindustrie in Sachen der Raumfrage und der Genossenschaft in der Persönlichkeitsfrage und sucht den drei Bedürfnissen des Arbeiters nach einer vernünftigen Arbeitsweise, nach einer menschlichen Lebenslaufbahn und nach einem gesetzmässigen Berufsnachrücken zu entsprechen. Im einzelnen wird behandelt: der Begriff des Lebensraumems und die Methode der Soziologie, der Lebenslauf eines Arbeiters, die Führungsstufen in der Welt der Arbeit, die Erhebung der Arbeiterschaft, die internationale Zeittafel, die Gesetze der Nachfolge, die Betriebsgliederung, der Entwurf eines Werkstattaussiedlungs-Vertrages, die Frage des Rechtsschutzes, die Widerstände der sozialen Theorien, die juristische Lösung, das Verhältnis der politischen Wirklichkeit zu der volkswissenschaftlichen Lösung. P. Plaut (Berlin).

147. Briefs, G., Ueber das Verhältnis des Proletarischen zum Sozialistischen. *Kölner Vierteljahrsh. f. Sozial.*, 1923, 3, 99–109.

Es handelt sich um den Begriff des modernen Sozialismus, im Gegensatz zu dem von Sombart geprägten Begriff des rationalen Sozialismus. Das Problem lautet demnach: In wiefern ist der moderne Sozialismus die Weltanschauung und Gesellschaftslehre des Proletariats? Wieweit muss folgerichtiges proletarisches Denken in den modernen Sozialismus ausmünden? Proletarier ist der besitzlose Lohnarbeiter, für den das Lohnverhältnis auf Grund herrschender sozialwirtschaftlicher Bedingungen lebenslänglich und vererblich geworden ist. Proletariat in objektivem Sinne ist die Gesamtheit aller unter proletarischen Daseinsbedingungen stehenden Existenzen; in subjektivem Sinne die bewusstseinsmässige Einheit aller Proletarier, die Proletarier als bewusste Klasse. Der Begriff des Sozialismus verliert jeden Anschluss an seinen herkömmlichen Inhalt und

seine Vergangenheit, wenn er weiter nichts besagen soll, als Bescheidung kapitalistischer Auswüchse gesteigerte öffentliche Sozialpolitik oder Wirtschaft als Dienst an der Gesamtheit. Der Sozialismus unserer Zeit, der im Denken der breiten Massen, ist der Marxismus. Nur für diesen Sozialismus kann der Satz und die übliche Gleichsetzung von Proletarischem und Sozialistischem gelten. Da die Marxschen Prämissen nicht stimmen, besonders diejenige, die behauptet, im Fortgang der Akkumulation wachse das Elend, die Arbeitsqual, die Sklaverei, Unwissenheit, Brutalisierung und moralische Degradation, so kann man die proletarische Determination zum Sozialismus nicht mehr halten. Mit der Hebung des Proletariats und seinem gesellschaftlichen Aufschwung verfiel die Fiktion des allproletarischen Klasseninteresses. P. Plaut (Berlin).

148. Haussleiter, O., Jurisprudenz und verstehende Soziologie. Anmerkungen zur Staatslehre Hans Kelsens. *Kölner Vierteljahrsh. f. Soziol.*, 1923, 3, 110–123.

Die formal-systematische Einheitskonstruktion der Rechtsordnung ist, wie Kelsen selbst zugibt, zur Erklärung der sozialen Phänomene "Staat" und "Recht" ungeeignet. Sie liefert wegen ihrer Inhaltslehre der verstehenden Soziologie nicht einmal ein als Deutungsschema brauchbares Normensystem, dessen wirksamkeit uns die tatsächliche Unterordnung der Menschen unter die stattliche Herrschaft und das staatliche Recht verständlich machen könnte. Max Weber hat die richtige Fragestellung jeder erklärenden Staatssoziologie gefunden: Wie ist die Unterordnung der Menschen unter die staatliche Herrschaft zu erklären? Da das Recht als wichtigstes, wenn auch nicht einziges Herrschaftsmittel im modernen Staat ebenfalls in den Kreis der staatssoziologischen Untersuchung mit einbezogen werden muss, so muss die verstehende Staatssoziologie auch Rechtswissenschaft sein, freilich nicht Jurisprudenz, sondern Rechtssoziologie. Sie wird damit auch auf jenem Wissensgebiet mitarbeiten, das infolge des unbegründeten Anspruchs der Jurisprudenz, die Rechtswissenschaft schlechthin zu sein, lange Zeit sehr vernachlässigt worden ist. P. Plaut (Berlin).

149. Pamperrien, R., Zur Gestaltung des Ich-Du-Problems in der Dichtung. *Kölner Vierteljahrsh. f. Soziol.*, 1923, 3, 133–151.

Das Einlietungskapitel zu einer Abhandlung über "Die Gestaltung des Ich-Du-Problems in Dehmels Werk." Analyse des sozialen und

kosmischen Handelns mit besonderer Berüchsichtigung der psychoanalytischen Methodik. Dabei lautet die Frage nicht etwa: Wie hat Richard Dehmel sozial gehandelt, sondern: Wie wird in seinem Werk sozial gehandelt. Aus der Art, wie die einzelnen Personen und die Strebungen, die sie verkörpern, miteinander streiten und übereinander die Oberhand gewinnen, lässt sich so etwa wie die Einstellung des Dichters zum sozialen Handeln, seine "soziologische" Einstellung ablesen. Es lassen sich auch oft aus der Art der Darstellung Forderungen des Dichters für die Gestaltung einer sozialen Beziehung ableiten. P. PLAUT (Berlin).

150. MEUSEL, A., Die Abtrünnigen. *Kölner Vierteljahrsh. f. Soziol.*, 1923, 3, 152–169.

Zwei Gruppen von Abtrünnigen werden unterschieden, die in entgegengesetzter Richtung handeln: die einen bewahren die heute geltende Form der sozialen Ordnung, die anderen bereiten die von morgen vor. Beide müssen sich daher bekämpfen. Innerhalb der ersten Gruppe gibt es wieder zwei entgegegengesetzte Typen: diejenigen, die mit ihrem ganzen Sein, soziologisch und ideologisch, zur revolutionären Gruppe übergehen, und diejenigen, die ausschliesslich ideologisch in den sozialen Emenzipationskampf eintreten und ihn vorwärts trieben. Je nachdem nun die soziologische oder ideologische Verwandtschaft von grösserer Bedeutung für die Ausprägung der Persönlichkeit wird, lassen sich zwei Typen von Abtrünnigen unterscheiden. Zum ersten Typus gehören die "ehrlichen Mittler," die zwischen den Parteien stehen, ohne einen endgültigen Bruch mit den Traditionen ihrer Vergangenheit vollziehen zu können. Der zweite Typus wird durch die "Radikalen" gebildet, die Verteidiger des Terror, die Feinde der herrschenden Klasse. Die Grenzenlosigkeit ihres Radikalismus ist ein Produkt des sozialen Krieges. Man darf aber hierbei den Radikalismus nicht etwa als eine Leidenschaft des Kampfes und eine rein instinktiv zweckmässige Einpassung in das gewählte Milieu auffassen; es handelt sich hier vielmehr um ein Erlösungsbedürfnis, das zur Masse treibt, um der Einsamkeit des Ich zu entrinnen. Die Abtrünnigen sind aber dekadent, indem sie durch ihr Tun und Lassen den Lebenswillen der bevorzugten Schicht, der sie angehören, ständig verneinen. Sie wollen nicht, dass die Gruppe lebt, und sie haben daraus als Sinzelne die Konsequenz gezogen. Wesentlich ist auch das Verhältnis der Masse zu den Abtrünnigen. P. PLAUT (Berlin).

151. Wiese, L. v., Die Tafel der menschlichen Beziehungen. *Kölner Vierteljahrsh. f. Soziol.*, 1924, 3, 250–263.

Wiese setzt hier seine programmatischen Skizzen zu einer systematischen Beziehungslehre fort. Für diese "Soziologie als Lehre von den Beziehungen und Beziehungsgebilden der Menschen" wird hier ein ausführlicher Ordnungsplan aufgestellt. Wiese unterscheidet: (1) Soziale Beziehungen erster Ordnung; (2) Soziale Beziehungen zweiter Ordnung (soziale Prozesse im engeren Sinne). In die erste Abteilung fallen: (a) Beziehungen des Zu-und Miteinander; (b) Beziehungen des Auseinander und Ohneeinander, ferner Mischbeziehungen von a. und b. Bei den a-Beziehungen weist er zunächst ale Voraussetzungen auf die Kontakte hin, die primärer oder sekundärer Natur sein können. Ein primärer Kontakt ist zum Beispiel das: ansehen, ausfragen, begrüssen, besuchen, küssen, etc.; ein sekundärer Kontakt: sich sehnen, jemandes gedenken, mit jemandem in brieflichen, oder telephonischen Verkehr treten. Die a-Beziehungen lassen sich gruppieren nach den Gesichtspunkten: Annäherung, Anpassung, Angleichung, Vereinigung. Bei den b-Beziehungen haben wir: Konkurrenz, Opposition, Konflikt.— Folgezustände der a-Beziehungen sind: Geselligkeit, Gesellschaft, Verbundenheit-Abhängigkeit; Folgezustände von a + C + M (Misch-Beziehungen) sind: Entstehung von Gebilden (Massen, Gruppen, abstrakte Kollektiva). Die Beziehungen zweiter Ordnung zeigen die c-Prozesse (differenzierende Prozesse), d-Prozesse (integrierende Prozesse), e-Prozesse (zerstörende Prozesse), f-Prozesse (umbildend-aufbauende Prozesse). Die c-Prozesse zeigen die Entstehung von Ungleichheit, das Beherrschen und Dienen, die Schichtenbildung, die Individuation. Die d-Prozesse: Uniformierung, Einordnung, Ueberordnung, Unterordnung; die e-Prozesse enden im Verfall, durch Abtrünnigkeit, Demagogie, Proletarisierung, Kommunismus, etc. Schliesslich bedeuten die umbildend-aufbauenden f-Prozesse eine Neubildung durch: Institutionalisierung, Professionalisierung, Befreiung. P. Plaut (Berlin).

152. Bauer-Mengelsberg, K., Stand und Klasse. *Kölner Vierteljehrsh. f. Soziol.*, 1924, 3, 275–287.

Ein Ueberblick über die historisch getrennte Genese der beiden Begriffe; die Stände sind beruflich fundiert; das Verhältnis der Stände untereinander muss ein organisches sein; sie arbeiten nicht gegeneinander, sondern miteinander. Sie stellen gegenüber der Klasse

eine weit wesenhaftere, mehr seelische und geistig verwurzelte soziale Erscheinung dar. Die Klasse als soziales Gruppengebilde gewinnt ihre Einheit weniger als positive Gemeinschaft aller ihr zugehörigen Individuen als aus der negativen Funktion anderen sozialen Gruppen feindlich gegenüber zu stehen. Daher ist der Kampf ihr eigentliches Interesse. Die Klasse ist auf sozialem Gebiet das eigentlich entwicklunsgfördernde Element; sie wird dadurch, dass sie die wirtschaftliche Grundlage einer Gesellschaft dauernd verschiebt, eine Setzung vorwiegend geistiger Elemente verhindern. Sie kann nur den Boden bereiten für eine Zeit des Ausgleichs der Interessen, die gewissermassen als Ruhepunkte zwischen die dynamischen Perioden eingebaut ist, in der dann die prüchte reifen und in objektiven Werten ihren Niederschlag finden. Dem entspricht, dass der Charakter der sozialen Utopien, die das Ziel einer Entwicklung darstellen, meist eine Gemeinschaftsform widerspiegeln, die von ständischem Geist erfüllt ist. P. Plaut (Berlin).

153. Lipmann, O., Beratung und Auslese für Schulbahn und Beruf. *Päd. Warte,* 1924, **31**, 157–163, 199–206.

Grundsätzliche Erörterungen unter Berüchsichtigung des gegenwärtigen Standes des Ausleseproblems in Deutschland. Die Entwicklung der Schulorganisation in der Richtung auf die Auslese für Schulbahn und Berufsberatung verlangt von der pädagogischen Arbeit auch eine aktive Beteiligung in der Psychoprognostik. Die Zuordnung eines Individuums ist nach beiden Richtungen möglich: als Personenauslese, indem man dem Sachgebiet die geeignetsten Personen zuführt, als Sachgebietsauslese, indem man für ein Individuum das geeignetste Betätigungsfeld herauszufinden versucht. In Deutschland wird im wesentlichen noch immer Personenauslese getrieben, obgleich die Sachgebietsauslese das volkswirtschaftlich wertvollere Arbeitsgebiet bedeutet. Als sehr wesentlich wird betont, die Zuordnung nicht nur einmal vorzunehmen, sondern sowohl in Schule und Beruf des öfteren unter psychologischen Gesichtspunkten zuzuordnen, je nachdem sich die Individualkonstellation oder Sachgebietskonstellation geändert hat. Beiden Formen der Auslese liegt die Sachgebietskunde zugrunde. Grundsätzlich wird festgestellt, dass die Personenauslese einer weit eingehenderen Sachgebietskunde bedarf als die Zuordnung einer Person zu einem Sachgebiet. Die im Dienst der Psychoprognostik stehenden diagnostischen Verfahren, Experiment, Selbst- und Fremdbeobachtung werden kritisch bekeuchtet in ihrer

doppelten Gerichtetheit auf Eignung und Neigungen. Die letzteren spielen bei der Zuordnung nur insoweit eine Rolle, wie sie den Schluss auf den Besitz der entsprechenden Befähigung gestatten, und dauerhafter Natur sind. Es interessieren ferner nur die formal gerichteten Neigungen und Eignungen, da man nur von ihnen annehmen kann, das sie über längere Zeiträume konstant sind. H. Bogen (Berlin).

154. Anderson, V. V., The Demonstration Clinics Conducted by the Division of the Prevention of Delinquency of the National Committee for Mental Hygiene. *Amer. J. of Psychiat.,* 1924, 3, 779–790.

Under the Commonwealth Fund of New York a five-year program has been undertaken to spread new methods in the prevention of delinquency. Three clinics, staffed with psychiatrists, psychologists, psychiatric social workers, clinic managers, statisticians, and stenographers, have been established. Two of these clinics are for demonstrating in cities which desire to establish permanent clinics. The third is called the "consulting field service," and is available to those who wish aid and advice in developing their own established clinics. Various details of financing, location, staffing, and organization are reported. A. L. Gould (Boston Psychopathic Hospital).

155. Burr, E. T., Vocational Guidance for the Maladjusted. *Nat. Health,* 1924, 6, 399–401.

Description of the work of the Vocational Adjustment Bureau with 946 subnormal or psychopathic girls in 1923, 40 per cent of whom were successfully placed in industry. D. A. Laird (Colgate).

156. Smith, M. H., The Mental Conditions Found in Certain Sex Offenders. *Lancet,* 1924, 206, 643–646.

Seventeen out of 100 cases of indecent exposure or assault were not found psychotic or subnormal; 31 were found to have had their offense start in mental conflict, which diagnosis was accepted by the court in 11 cases. There were 8 insane and 26 mental defectives, all certified as such. D. A. Laird (Colgate).

11. MENTAL DEVELOPMENT IN MAN

157. GAINSBURG, J. C., Fundamental Issues in Evaluating Composition. *Ped. Sem.*, 1924, **31**, 55–77.

Alone of all the important classroom subjects composition has shown little improvement in teaching methods. The elaborated scales for measuring composition have been no "cure-all," and partly because they have not measured certain very important traits. Besides the mechanics of grammar and logical structure, devices for arousing interest and the artistic and creative qualities need to be evaluated. J. F. DASHIELL (North Carolina).

158. LAIRD, D. A., How the College Student Responds to Different Incentives to Work. *Ped. Sem.*, 1923, **30**, 366–370.

The college student responds with more earnest work to the so-called positive incentives rather than to the negative incentives. There is but little difference between college students and high school students in the response to the incentives studied. J. F. DASHIELL (North Carolina).

159. LAIRD, D. A., The Careers of the College Student. *Ped. Sem.*, 1923, **30**, 347–357.

A survey was made of careers chosen by the freshmen and the seniors at the University of Wyoming. Over two-thirds of the freshmen selected engineering, commerce, law, and teaching. The stated reason for each choice made was analyzed into the "future" it offered, the immediate and unanalyzed "interest" taken in it, or the prospect of "service" it opened up. Women select their careers from idealistice reasons three times as frequently as men, while men select their careers three times as frequently from practical reasons connected with providing for a successful future. The young men who selected their careers from practical motives tended to rank highest in intelligence, while those who chose their life work from idealistic reasons tended to be the lowest in the entire class. With the young women exactly the reverse relationship was found to exist. Of the seniors questioned, one-third had changed their vocational choice since their freshman year, and this group shows markedly less emphasis upon the idealistic motives in making the choice. J. F. DASHIELL (North Carolina).

160. WILLIAMS, P. E., A Study of Adolescent Friendships. *Ped. Sem.*, 1923, **30**, 342–346.

The subjects of this study were eighty-four boys of adolescent age from the Boys' School, a school for delinquent boys in Cleveland. The results of the study are: 1. The boys tend to choose chums of about the same chronological age. 2. They choose chums of about the same mental age, with a slight tendency to choose those of greater mental age. 3. They choose friends because of fairness, fun, sportsmanship, friendliness, and athletic ability. 4. They would stick by a friend through thick and thin—no matter what he did. 5. They would almost never tell on him in case he got into trouble. 6. If he showed himself to be a coward they would either stick by him to help him win out, or would drop him because they hate cowardice. J. F. DASHIELL (North Carolina).

161. LAIRD, D. A., How the High School Student Responds to Different Incentives to Work. *Ped. Sem.*, 1923, **30**, 358–365.

Reports of college students as to the character of their work in high school years following different kinds of incentives received or experienced by them show: that reprimands, sarcasm, ridicule, low grades, love affairs, and extra assignments all tend to have undesirable effects upon one's work, whereas conferences, commendations, remission of assignments, have desirable effects. J. F. DASHIELL (North Carolina).

162. CUNNINGHAM, A. B., Student Grades in Required and Elective Courses. *Ped. Sem.*, 1923, **30**, 389–392.

A tabulation of 2,292 grades shows that the distribution of grades received in college required courses of several departments resembles very closely the distribution of grades in elective courses. This has an important bearing upon the charges that many teachers give higher grades in their elective courses in order to attract students thereto; also upon the claim that students do better work in courses they elect. J. F. DASHIELL (North Carolina).

163. TERMAN, L. M., The Mental Test as a Psychological Method. *Psychol. Rev.*, 1924, **31**, 93–117.

Professor Terman compares the mental test and the psychological experiment, basing his comparison upon a questionary sent to twenty-two psychologists. The following differences were noted: "1. Tests

are intended to throw light upon individual differences; the experiment, to establish general principles. 2. The test, in contrast to the experiment, is characterized by simplicity, or brevity, or less elaborateness, or the use of paper and pencil instead of apparatus. 3. The test has a practical aim, usually individual diagnosis and guidance; it has to do with technology rather than with science." Five correspondents point out the methodological identity of test and experiment. The main thesis of the paper is that the mental test and the psychological experiment are essentially alike, and this is shown by examining the alleged grounds of distinction: (1) Use of tests in individual psychology; (2) pencil and paper character; (3) omission of introspection; (4) exactness, verifiability of results, control of conditions, and possibilities of analysis; (5) practical *vs.* theoretical aim. An historical survey shows that the mental test and the psychological experiment have grown up together. The psychologists questioned voted that the test method compares well in importance with other accepted psychological methods. P. T. YOUNG (Illinois).

164. WILSON, W. R., Selection in "Trial and Error" Learning. *Psychol. Rev.*, 1924, 31, 150–160.

After a discussion of Thorndike's law of effect and law of exercise and of Watson's attempt to explain trial and error learning on the basis of frequency and recency, the author points out fallacies in these views, showing that no one of them is an adequate explanation of learning. The theory presented is based upon Smith and Guthrie's formulation, which is a development of the work of Morgan, Hobhouse, and Holmes. Approach and avoidance may be called out by one and the same object, as in the case of the baby and the candle. So the cat in a puzzle box at first approaches the bars and later avoids them; avoidance becomes a conditioned response to the bars. One by one the movements of approach get inhibited and finally the animal turns to the button. It is then attracted by the open door. Turning to the button and then to the open door are noninhibited responses. Conditioned response along with the overlapping of compatible movements thus gives an adequate explanation of trial and error learning. P. T. YOUNG (Illinois).

165. FRYER, D., Intelligence and Interest in Vocational Adjustment. *Ped Sem.*, 1923, 30, 127–151.

Investigation of 320 men applying for vocational counsel shows: (1) That men in the higher occupational levels are most interested in

such counsel; (2) that the men higher in intelligence are most interested; (3) that 60 per cent of the men applying are maladjusted on the basis of intelligence, 50 per cent because of more and 10 per cent because of less intelligence than required by their occupations; (4) that the predictive value of interest to ability probably increases from somewhere around zero in infancy to nearly .50 in middle life. J. F. DASHIELL (North Carolina).

166. YOUNG, K., Genius: What Is It? Can It Be Anticipated? *Ped. Sem.*, 1923, **30**, 172–176.

The nature of genius is a matter of great complexity not simply analyzable into intellect and emotional traits, and at present we certainly do not have adequate tools for measuring or predicting genius. J. F. DASHIELL (North Carolina).

167. HONIGSHEIM, P., Die Pubertät. *Kölner Vierteljahrsh. f. Soziol.*, 1924, **3**, 264–274.

Unter Pubertät wird hier nicht eine durch bestimmte Lebensjahre abgegrenzte Altersklasse verstanden, sondern der Vorgang unmittelbar vor, während und hinter der Geschlechtsreife. Die Fragen, die hier zur Erörterung stehen, lauten: Welche assozierenden Faktoren sind innerhalb dieser Periode wirksam? Welche Formen der Vergesellschaftung finden sich hier vor? Sind die beobachteten Erscheinungen unterscheidende Merkmale für jene Lebensalter überhaupt oder eignen sie nur den betreffenden Menschen unserer Tage? Zwei Momente kommen inbetracht: ein Faktor der Negation und einer positiver Natur. Das erste Kriterium besagt: es bildet sich ein Zusammenschluss, der veranlasst wird durch die gemeinsame Abwehr der Form des Verknüftseins der Aelteren und durch den Kampf gegen die Tendenz der letzten: die Jugend in gleicher Weise mit der ihr voraufgehenden Generation und unter sich zu assozieren. Da die Jugend sich durch das Eingreifen von Erwachsenen behindert fühlt, so richtet sich die Ablehnung primär gegen die Schöpfungen der letzten, die unmittelbar in das Leben der Jugendlichen eingreifen, gegen Elternhaus, Schule, Staat, usw. Dazu kommt der zweite Faktor: das Sexuelle, das zwar schon im schulpflichtigen Alter latent ist, aber dissozierend wirkt. Es folgt ein Zwischenstadium, dem die eigentliche Pubertät folgt. Zu der geschilderten Opposition gegen die Vergesellschaftung treten neue Momente hinzu, zum Teil unbefriedigter Sexualtrieb, der zur Melancholie, Isolierung oder auch zu

engerer Verbindung mit Andersgeschlechtigen führen kann, also wieder mit positiver Wirkung. Honigsheim kommt unter anderem zu folgendem Ergebnis: weder inbezug auf Kampffront und Methode kann von einer Gemeinschaft bei Gruppen assozierter Jugendlicher die Rede sein, noch auch inbezug auf die Zielsetzung. Darum ist auch die Jugendbewegung uneinheitlich; sie kann als Ganzes nichts leisten, sondern immer nur innerhalb des Gebildes, dem sie aus irgendwelchen Gründen nahe steht. P. Plaut (Berlin).

168. Lipmann, O., Psychische Geschlechtsunterschiede. Beih. 14, *Z. f. angew. Psychol.*, 1924, 108–192.

Das Buch in dem rund 5,000 Einzelresultate gesammelt und verarbeitet sind, ist längst zu einem unentbehrlichen Hilfsmittel zur Orientierung über die wichtigsten Forschungsergebnisse auf dem Gebiet der psychischen Geschlechtsunterschiede geworden. So darf auch die neue Auflage einer dankbaren Aufnahme gewiss sein, umsomehr als die praktische Frage, der sie inerster Linie dient, unverändert aktuell ist: "Inwieweit sind Koinstruktion und Koedukation durch die gleiche Veranlagung der Geschlechter gerechtfertigt, bezw. wieweit verbieten sie sich durch grundlegende Wesensunterschiede?" Das Ergebnis, "dass der Stand unseres Problems heute noch ein derartiger ist, dass es verfrüht erscheinen muss, dis psychischen Geschlechtsunterschiede auf eine Formel zu bringen," schmälert nicht sein Verdienst, i. G. Nichts ist so notwendig, als eine objektive wissenschaftliche Darstellung dieses Gebiets, auf dem subjektive Voreingenommenheit sich in besonderem Grade geltend macht.—Der zweite Band enthält die tabellarischen Unterlagen zu den im ersten Band nach Eigenschaften und Fähigkeiten geordneten Ergebnissen. H. Sachs (Berlin).

169. Lunk, G., Münchener Erhebungen über das Interesse der Schüler an den Lehrgegenständen. *Z. f. päd. Psychol.*, 1924, 25, 32–45.

Die Untersuchung erstreckt sich auf 8–14 jährige Volksschüler und schülerinnen. Nach der Wertigkeit der Fächer werden diese in je eine positive, indifferente und negative Gruppe geschieden. Als Ursachen für Zuordnung zur positiven Gruppe kommen in Frage: die Interessehaltigkeit des Lehrstoffs, die Wirkung der Lehrerpersönlichkeit und die Wertigkeit des Schülers. Als wertvolleres allgemeines Ergebnis der Untersuchung sei erwähnt, dass die Stetig-

keit des Beliebtheitsurteils mit dem Grade der Begabung wächst. H. Bogen (Berlin).

170. Blume, P., Eine Untersuchung über die Entwicklung der Willenskraft bei Schulkindern. *Z. f. päd. Psychol.*, 1924, **25**, 45–53, 86–94.

Zur Messung der Willensstärke wird festgestellt, wie lange die Versuchsperson in einen Spiegel sehen kann, ohne die Augen schliessen zu müssen. Es sind deutliche Geschlechtsunterschiede in der Entwicklungskurve erkennbar sowohl der Höhe als auch dem Verlauf nach. Das Verhalten des Einzelnen gestattet, ihn gewissen Willenstypen zuzuordnen, z. B. nach dem Grade der Erfolgsicherheit, nach dem Assoziationsreichtum, nach der Höhe der Leistung (Star- Norm- und Schwachwiller), nach dem Verlauf einer grösseren Reihe von Versuchen an der gleichen Versuchsperson in gleichmässige, schwankende und solche mit steigender resp. abfallender Willensleistung. Das intellektuelle, gefuhls- und willensmässige Abweichen einer Person von der Normalität spiegelt sich—allerdings nicht in fest umrissener Typik—auch bei den Leistungen im Blicktest. Die Ergebnisse der Massenversuche zeigen ein allgemeines Sinken der Leistungen gegenüber den Einzelversuchen, sowie die typischen massenpsychologischen Wirkungen, die bei bestimmten Typen Leistungssteigerung, bei anderen Leistungsabfall bewirken. H. Bogen (Berlin).

171. Honecker, M., Zur Psychologie und Pathologie der sittlichen Wertung. *Z. f. päd. Psychol.*, 1924, **25**, 65–75.

Wertgefühle sind komplizierte Gebilde, in denen neben Gefühlen in erster Linie Gedanken wirksam sind. Das gedankliche Moment wird als eigentlicher Träger des Wertsinnes angesprochen. Das Gefühl ist Begleiterscheinung, und wir begegnen ihm beim Erlebnis der Wertfundierung und in der ontogenetischen Entwicklung des Wertens durch die Verknüpfung jedes neuen bewussten Seinszustandes mit einem Lust- oder Unlustgefühl. Diese Auffassungen gelten auch für das sittliche Werten. An den Ursachen sittlicher Defekte wird die Theorie verifiziert. Die drei Hauptursachen der sittlichen Defekte liegen im Defekt in der Genese, der Ichbezüglichkeit und der Motivation der Einzelhandlung. Es wird im einzelnen die mehr oder weniger starke Beteiligung des emotionellen resp. intellektuellen Faktors aufgezeigt. H. Bogen (Berlin).

172. Schlemmer, H., Vererbung und Erziehung. *Z. f. päd. Psychol.*, 1924, 25, 75–86.

Zeigt die Möglichkeiten und Grenzen der Wirkung pädagogischen Tuns im Hinblick auf die durch die Vererbungswissenschaft aufgedeckten Tatsachen auf. Das Ergebnis der Untersuchung ist eine Anerkennung der Grundgedanken des Natorp'schen Systems, dass man niemals einen Menschen von aussen her bilden kann, sondern höchstens das Sichselbstbilden des jüngeren Menschen zu fördern und zu schützen vermag. H. Bogen (Berlin).

173. Köhler, G., Experimentell-pädagogische Untersuchungen über die Entwicklung der mathematischen Kritikfähigkeit. *Z. f. päd. Psychol.*, 1924, 25, 94–100.

Versuchsmaterial waren angewandte Rechenaufgaben, die auf ihre Lösbarkeit beurteilt werden sollten. Im Falle der Unlösbarkeit, war der Grund anzugeben.—Das mathematische Denken der Unterstufe stellt sich als reines Zahlendenken dar; das kritische Arbeiten des Durchschnitts ist mechanisch und gefühlemässig. Die Pubertät übt auf die Entwicklung abstrakter Probleme, wie es die mathematische Kritikfähigkeit darstellt, keinen merkbaren Einfluss aus. Es verschwindet nur das reine Zahlendenken. Nach der Pubertät tritt ein Rückgang in den Leistungen in Erscheinung infolge des Widerwillens gegen kritisches Denken überhaupt. H. Bogen (Berlin).

174. Runge, Richtlinien zur Erkennung psychischer Anomalien bei Schulkindern. *Z. f. päd. Psychol.*, 1924, 25, 117–119.

Schlagwortartige Zusammenstellung kritischer Symptome, die dem Lehrer eine Hilfe sein soll bei Ueberweisung von Schulkindern zu psychiatrischer Untersuchung. H. Bogen (Berlin).

175. Köhler, T. und W., Ueber tierpsychologische Erfahrungen und ihre Anwendung in der Psychologie der frühen Kindheit. *Kindergarten*, 1923, 64, 26–34.

Die Erforschung frühkindlichen Denkens muss sich von der Anschauung frei machen, als hätte man es hier mit primitiven Denkformen des Erwachsenen zu tun. Um die selbständige Eigenart des frühkindlichen Denkens erfassen zu können, werden die modernen tierpsychologischen Methoden auf die Kindheit anzuwenden sein. H. Bogen (Berlin).

176. KELLER, TH., Ueber Willensstörungen bei Kindern. *Z. f. Kinderforsch.*, 1924, **28**, 221–239.

Gibt einen Ueberblick über die Willensdefekte im Kindesalter, die als abnorme anzusprechen sind unter Hervorhebung ihrer Behandlungsmöglichkeiten. Verf. legt in der Behandlung den Hauptwert auf eine dem Defekt angepasste Arbeitstherapie und lehnt die psychanalytische Heilbehandlung im allgemeinen ab. In der Entwicklung der Grundsätze einer sinngemässen Arbeitstherapie wird genetisch vorgegangen, indem die Bildungsmoglichkeiten der verkümmerten Willensfunktionen der Defektein aufsteigender Reihe bei Idiotie, Imbezillität, Debilität usw. klargestellt wird. Beispielsweise werden die " Willenshandlungen " des Imbezillen als eine Sukzession von einzelnen, unter sich oft nur gering zusammenhängenden Triebhandlungen betrachtet. Durch Aneinanderreihung triebartiger, d. h. eindeutig bestimmter Handlungen und durch schliessliche Mechanisierung des gesamten in Betracht kommenden Komplexes kann der Imbezille zu produktiver Arbeit erzogen werden. H. BOGEN (Berlin).

177. STERZINGER, O., Begabungsuntersuchungen an Hilfsschülern. *Z. f. Kinderforsch.*, 1924, **28**, 240–251.

Hilfsschüler und 2–3 Jahr jüngere Schüler höherer Schulen wurden mit den gleichen Tests geprüft. Die Hilfsschüler bleiben in allen Leistungen hinter den Leistungen der Vergleichsgruppe zurück. Ihre Durchschnittsleistungen nähern sich denen der höheren Schüler im logischen Gedächtnis, Merken sinnvoller Worte und in der konstruktiven Begabung. Die Hälfte der Durchschnittsleistung der höheren Schüler wird erreicht bei Aufmerksamkeitstests und Aufgaben zur Prüfung der Schnelligkeit der geistigen Einstellung auf neue Inhalte. Noch geringer sind die Leistungen im mechanischen Gedächtnis und im Bilden von Sätzen aus durcheinandergewürfelten Hauptbestandteilen derselben. Die Ergebnisse aus den Prüfungen des mechanischen Gedächtnisses stehen überraschenderweise in guter Korrelation zu den Schulleistungen.—Aus der Tatsache, dass einzelne Hilfsschüler mit einigen ihrer Prüfleistungen in die guten und durchschnittlichen Leistungen der höheren Schüler hineinreichen, wird der Schluss gezogen, dass bei den Hilfsschülern in noch stärkerem Masse als bisher individualisiert werden muss im Unterricht und in der Berufsbahnberatung. H. BOGEN (Berlin).

178. Simonic, A., Die Gruppenauffassung als Intelligenzfaktor. (Versuche an einem Schwachbefähigten.) *Z. f. Kinderforsch.*, 1924, **28**, 252–262.

Verf. hat eine grössere Reihe von Figuren- Zusammensetzaufgaben in steigender Schwierigkeit an einem 12 jährigen Schwachbefähigten durchgeprobt. In den meisten Fällen versagt die Vp, wenn die Zweiheit der aufzufassenden Elemente überschritten wird. Diese mangelnde Fähigkeit in der Erfassung raum- und zeitverteilter Gestalten erweist sich in dem vorliegenden Falle als in erster Linie verursachend für die Schwierigkeit des Aufbaus eines lückenlosen und in innerem Zusammenhang erfassten Weltbildes. " Die Gruppenauffassung erweist sich schlechthin als Intelligenzfaktor von spezieller Bedeutung, der bei Individuen normaler Auffassungsweise innerhalb kleinerer Schwankungen nicht auffällig bemerkbar ist, bei psychisch defekten Konstitutionen indess stark hervortritt." H. Bogen (Berlin).

179. Giese, F., Die Arbeitsprobe in der Psychognostik. *Z. f. angew. Psychol.*, 1924, **23**, 162–187.

G. versteht unter Arbeitsprobe " den Versuch, in *geregelter* Form und an *neutralem Stoff* dem Prüfling Aufgaben zu stellen, die uns auf Grund seines dabei zu *beobachtenden werktätigen* Verhaltens einen Einblick in seine *charakterologische* Struktur ermöglichen."— Die Tatsache, dass die Reaktionen seelischer Funktionen in Isolierung anders geartet sind als in ihrer natürlichen strukturellen Einbettung, gestattet nicht, aus der Zusammenfassung der Leistungswerte mehrerer elementarer isolierter Funktionen eines Funktionskomplexes einen gültigen Schluss auf die Entwicklung des Komplexes zu ziehen. Die exakte Isolierung sogenannter elementarer Funktionen ist nur in den seltensten Fällen überhaupt erreichbar. Diese Tatsachen zwingen dazu, Arbeitsfunktionen innerhalb ihrer natürlichen Gebundenheit zu diagnostizieren. Das Erkenntnismittel ist die Arbeitsprobe, welche in der Psychognostik stärker verwendet werden muss, vor allen Dingen auch wegen der Möglichkeit zu charakterologischer Erfassung des Prüflings. Es wird Material geboten über be währte Arbeitsproben, ihre Durchführung, rechnerische und beobachtende Durchdringung. Als besondere Vorteile der Arbeitsprobe haben folgende zu gelten: Sie gestattet einen geschmeidigen Uebergang zwischen Schul- und Berufsanforderungen. Sie dient als neutrales Prüfmittel ausgesprochen sozialen Zwecken. Die Vielseitigkeit des Auswertens

ihrer Ergebnisse gestattet die Erkennung positiver Symptome auch an dem für eine besondere Berufsgattung ungeeignet Befundenen. Sie ist weniger empfindlich gegen Unterschiede des Alters, der Schulbildung des Geschlechts und der sozialen Schicht. H. Bogen (Berlin).

180. Schröder, F., Berufsanalyse der Buchdrucksparten. *Z. f. angew. Psychol.*, 1924, **23**, 188–196.

Als psychophysische Voraussetzungen der Arbeit des Schriftsetzers werden herausgestellt: Dauerleistung der verteilten Aufmerksamkeit, gute Lernfähigkeit, Schnelligkeit des Einlebens in Handschriften, Abschätzen von Raumstrecken, Feingefühl der Finger und Gelenke. Für die Akzidenz- und Anzeigensetzer sind noch künstlerische Qualitäten im Dienste der räumlichen Anordnung des Satzes und gutes Gedächtnis für wirksame Satzbilder in verschiedenster Schriftart wesentlich.—Der Beruf des Korrektors stellt höhere Anforderungen an die Entwicklung der Intelligenz und des Gedächtnisses. Der Drucker leistet bei geringer en Ansprüchen an seine Intelligenz Qualitätsarbeit vor allen Dingen dann, wenn seine verteilte Aufmerksamkeit, Sinnestüchtigkeit des Auges in Bezug auf Helligkeiten und Farben und das Feingefühl der Gelenke für genaue Einstellungen gut entwickelt sind. Die Höhe und Art des Entwicklung des Maschinensinnes hängt von den Anforderungen der jeweiligen Arbeitsstelle ab.—Der 2 Teil der Arbeit gibt eine Kritik einiger bisher in Deutschland verwendeter einschlägiger Prüfverfahren. H. Bogen (Berlin).

181. Schüssler, H., Die Entwicklung des verallgemeinernden Denkens bei Kindern und Jugendlichen. *Z. f. angew. Psychol.*, 1924, **23**, 204–207.

Zur Prüfung verallgemeinernden Denkens wurden Fabeln benutzt, aus denen der Grundgedanke herauszufinden und zu formulieren war. Bis zum 15 Lebensjahr zeigen sich die Mädchen den Knaben überlegen, später tritt der umgekehrte Sachverhalt in Erscheinung. Es besteht im grossen und ganzen Uebereinstimmung zwischen Entwicklungskurven des schlussfolgernden und des verallgemeinernden Denkens auch hinsichtlich der Periode verstärkten geistigen Wachstums, die in den gleichen Zeitraum zu liegen kommt. H. Bogen (Berlin).

182. Moers, M., Ein Beitrag zur Untersuchung der Augenmassprüfung. *Z. f. angew. Psychol.*, 1924, 23, 257–292.

An den gleichen Versuchspersonen wurden in längerer Zeitspanne täglich Versuche über Halbieren und Dritteln von Strecken vorgenommen. In der ersten Hälfte der Versuchsperiode wurde ohne Bekanntgabe des Fehlers, in der zweiten Hälfte mit Bekanntgabe des Fehlers gearbeitet. Der Einfluss der Übung macht sich als starker Faktor in Bezug auf den Zerfall der Rangreihen bemerkbar. Die Beurteilung des Augenmasses einer Person unterliegt sehr erheblichen Schwankungen bei Verwendung des konstanten Fehlers als Gradmesser der Leistung. Die Beurteilung an Hand der mittleren Variation unterliegt dem Rangreihenzerfall bedeutend weniger. Die m. V. ist datum als charakterisierende Wertzahl vorzuziehen. Versuchspersonen mit ganz schlechten Einreihungen unter Zugrundelegung der m. V. scheinen ihren Rangplatz nicht zu ändern. Das Verhältnis zwischen Arbeitszeit und Leistungsgüte gestattet eine gute Charakterisierung des Arbeitstyps einer Versuchsperson. H. Bogen (Berlin).

183. Richter, O., Untersuchungen an einem Tremometer. *Z. f. angew. Psychol.*, 1924, 23, 293–301.

Massenuntersuchungen am Blumenfeld schen Tremometer hatten das Ziel, festzustellen, bei welcher geringsten Anzahl von Versuchen mit diesem Apparat eine genügende diagnostische Sicherheit des Urteils über die Handruhe erreicht wird. Bei diesen Tremometer sind Metallringe verschiedenster lichter Weite über einen rechtwinklig gebogenen Stab zu führen. Es arbeitet der Prüfling am besten, bei dem die geringste Anzahl Berührungen zwischen Stab und Ring gezählt werden. Mit Hilfe der Korrelationsrechnung wurde festgestellt, dass ein Ring von 7 mm. lichter Weite über einen 3 mm. im Durchmesser haltenden Stab geführt, die günstigsten Möglichkeiten einer brauchbaren Beurteilung in sich schliesst. Dies gilt sowohl für einhändiges wie auch für beidhändiges Arbeiten. H. Bogen (Berlin).

184. Raspe, C., Kindliche Selbstbeobachtung und theoriebildung. *Z. f. angew. Psychol.*, 1924, 23, 302–328.

Die Untersuchung beschäftigt sich mit der Frage, ob Kinder in der Lage sind, psychologische Selbstbeobachtungen zu vollziehen und von welchen Voraussetzungen ihre Theorien ausgehen, die sie über

das Selbst-Erlebte bilden. Gegenstände der Untersuchung bildeten Versuche über den optischen Sukzessivkontrast, Verstellungsbilder, Reaktionsversuche und geometrisch-optische Täuschungen. Es zeigt sich, dass Kinder bis zu einem gewissen Grade zu Selbstbeobachtungen in der Lage sind, die auch in der Laboratoriumsunterschung verwertet werden könnten. Die kindliche Theoriebildung ist bestimmt durch Eigenschaften des Versuchsmaterials, durch physikalische Erscheinungen, physiologische und "mystische" Faktoren. Die mystische Theoriebildung vollzieht sich besonders leicht dann, wenn willkürlich eingeschaltète Begleitvorgänge, die ohne Kausalbeziehung zum Versuchsvorgang auftreten, vom Kinde als geheimnisvolle verursachende Faktoren angesprochen werden können. Die Theoriebildung vollzieht sich am schwierigsten beiden Reaktionsversuchen, am leichtesten bei denen über den optischen Kontrast. H. Bogen (Berlin).

185. Giese, F., Vom Kampfplatz der Psychotechnik. *Lehrerfortbildung,* 1924, Heft 1.

Beleuchtet die Krisen, welche die Psychologie bei ihrer Anwendung auf das Ausleseproblem durchzumachen hatte. Finanzielle Schwierigkeiten hemmen die Entwicklung der Fragebogentechnik, sowie auch die Verwendung von Tests, die immer wieder neu hergestellt werden müssen unter Geldaufwand. Es wird ferner die Ausgestaltung freier wissenschaftlicher Institute aus demselben Grunde zur Unmöglichkeit gemacht. Hindernd wirkt auf die Entwicklung ferner das Misstrauen des Arbeitnehmers gegen alles, was mit Taylorisierung zu tun hat. Der Arbeitnehmer bezieht die Psychotechnik in das Taylorsystem ein. Die Frage, ob Apparat oder Test sich als erfolgreicher erwiesen haben, dürfte dahin entschieden sein, dass der Apparat immer mehr zurückgedrängt wird. Es sprechen hier nicht wissenschaftliche Gründe mit. Die Zurückdrängung ist eher auf Skrupellosigkeit im Verkauf von nicht gründlich durchgearbeiteten Neukonstruktionen durch geschäftlich interessierte Psychologen zurückzuführen. Der Praktiker konnte mit diesem Prüfungsmaterial entweder nicht umgehen, oder das Material genügte den zu stellenden Anforderungen nicht. Auch hinsichtlich der Streitfrage, ob eine zu begutachtende Person in analytischem Verfahrenerfasst werden kann, oder ob das Totalverfahren eine einwandfreiere Begutachtung gewährleistet, scheint die Entscheidung im Sinne des letzteren Verfahrens zu fallen. H. Bogen (Berlin).

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HESNARD, A., *La Relativité de la Conscience de Soi.* Introduction à la Psychologie Clinique. (Preface by G. Dumas). Paris: Alcan, 1924. Pp. xvi+144.

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PALÁGYI, MELCHIOR, *Naturphilosophische Vorlesungen über die Grundprobleme des Bewusstseins und des Lebens.* Leipzig: Barth, 1924. Pp. xv+302.

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THE PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE THIRTY-THIRD ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, WASHINGTON, D. C., DECEMBER 29, 30, 31, 1924.

REPORT OF THE SECRETARY, JOHN E. ANDERSON, YALE UNIVERSITY

The American Psychological Association held its Thirty-third Annual Meeting in Corcoran Hall, George Washington University, Washington, D. C., on Monday, Tuesday and Wednesday, December 29, 30 and 31, 1924. The attendance was the largest in the history of the Association, 242 persons having signed the registration book. Although some of these were not members of the Association, it is likely that a number of the members present failed to record their names. There were 267 persons present at the Annual Dinner.

The program was the most extensive ever undertaken by the Association. So many papers were submitted, that the Program Committee found it necessary to place two sessions on each half day of the meetings making a total of eleven formal programs. Each of these crowded to capacity the room in which it was held. Exclusive of the session for informal reports by graduate students, sixty-four papers were presented, of which ten dealt with general psychology, twenty-three with experimental psychology, seven with industrial psychology, eight with social and racial psychology, seven with clinical psychology, seven with mental measurement, and two with the life of G. Stanley Hall. The special program for informal reports by graduate students which was one of the best programs of the meetings consisted of fifteen papers, of which fourteen were actually read. A very large proportion of the papers, taking the entire program into consideration, presented the results of experimental or test work.

A joint meeting with the American Political Science Association was held in the New Willard Hotel on Tuesday afternoon, the topic being "The Psychological Basis of Conservatism and Radicalism." This meeting was well attended by members of both societies and was a feature of the program.

Following the Annual Dinner of the Association a session in memory of G. Stanley Hall, the deceased President of the Association, was held, at which J. McKeen Cattell presided and at which addresses were given by Professor Burnham of Clark and Professor Starbuck of the University of Iowa.

On the invitation of the Program Committee Professor K. Koffka of the University of Giessen read a paper in the session for Experimental Psychology and Mr. Henry S. Dennison of the Dennison Manufacturing Company read a paper in the session for Industrial Psychology.

In addition to the formal programs, there were a number of Round Table Conferences, some of which had been arranged in advance and others which were organized at the meetings. There were two such conferences on Experimental Psychology, one on the Gestalt Psychologie, one on Clinical Psychology, three on Psychology and Politics, one on "The Drive," one on "Problems of Highway Safety and Automobile Traffic" and one on "Psychological Consultation for College Students." Members of the Association participated freely in the discussions at these informal conferences and feel that they constitute a valuable addition to the more formal program.

The feature of the Apparatus Exhibit which was held in the Physics Laboratory of George Washington University was the demonstration of two recently invented calculating machines for solving correlation problems.

Transactions of the Annual Business Meeting

The annual business meeting was held on December 29, 1924, in Room 39, Corcoran Hall, at eight o'clock, with Mr. Warner Brown, a senior member of the Council, in the chair, owing to the death of the President.

It was voted that the minutes of the Thirty-second Annual Meeting at Madison, Wisconsin, be approved as printed.

The Secretary made the following announcements:

Mrs. Lillian M. Gilbreth acted as representative of the American

Psychological Association at the International Management Congress held in Prague, Czecho-Slovakia, July 21 to 24, 1924.

Mr. H. A. Aikins represented the American Psychological Association at the inauguration of Robert E. Vinson as President of Western Reserve University and at the dedication of the new buildings of the School of Medicine, Western Reserve University, on the 9th of October, 1924.

Mr. Howard C. Warren represented the American Psychological Association at the funeral of Edmund C. Sanford, Tuesday, November 25, 1924.

The Secretary announced the deaths of:

G. Stanley Hall, February 1, 1846-April 24, 1924, age seventy-eight.

Edmund C. Sanford, November 10, 1859-November 22, 1924, age sixty-five.

The Secretary announced the resignation during the year 1924 of: J. F. Crawford, Frances R. Dewing, George M. Duncan, Edward H. Griffin, William A. Hammond, Clara N. Hitchcock, E. B. McGilvary, Dickinson S. Miller, W. R. Newbold, James H. Tufts and W. M. Urban.

The Treasurer's report as printed on page 79 was read and approved. The Treasurer presented the following estimate of resources for the year 1925:

Dues from members	$2,200.00
Sale of monographs (approximate)	5.00
Interest (approximate)	30.00
Cash in deposit and on hand	779.19
	$3,014.19

On the recommendation of the Council it was voted that the proposed additions to the by-laws as printed in the 1924 Year-Book representing a codification of certain past actions of the Association be adopted with a substitution of the word "division" for the word "section" in the phrase "section of consulting Psychologists" making the phrase read "division of consulting Psychologists" wherever it is printed in the by-laws and with the addition to the proposed by-law 7 of the sentence, "Certificates now granted as of the section of consulting Psychologists shall be equivalent to certificates awarded as of the division of consulting Psychologists."

On the recommendation of the Council it was voted to elect Mr. Edward S. Robinson Treasurer of the Association for the term 1925 to 1927.

On the recommendation of the Council it was voted to accept

the invitation to participate in the organization of a Social Science Research Council and to select two temporary delegates to function until the organization of the Social Science Research Council is completed and delegates can be selected in accord with the regulations of that organization.

On recommendation of the Council it was voted to elect Messrs. R. S. Woodworth and R. M. Yerkes as temporary delegates to the Social Science Research Council.

On the recommendation of the Council it was voted that the incoming President appoint a committee of three to investigate the matter of precautions to be taken in animal experimentation and to submit recommendations to the 1925 business meeting of the Association.

On recommendation of the Council it was voted that by-law 13 be deleted, thus making its provisions ineffective.

The Treasurer presented a budget for the year 1925 as printed on page 80 which was approved by the Association.

On the recommendation of the Council Messrs. W. V. Bingham and R. M. Yerkes were elected to represent the Association on the Council of the American Association for the Advancement of Science for 1925.

On the recommendation of the Council it was voted that the following Program Committee be elected for the year 1925: Mr. John E. Anderson, Chairman, Mr. J. C. Chapman and Mr. A. I. Gates.

On the recommendation of the Council it was voted that the invitation of Cornell University to hold the 1925 meeting at Ithaca be accepted, that the meeting be held in Ithaca on Monday, Tuesday and Wednesday, December 28th, 29th and 30th, and that H. P. Weld be the local representative of the Association.

On the recommendation of the Council the fifteen persons named below were elected to membership in the Association.

1. Baker, Harry J., Ph.D. University of Michigan 1923
   Clinical Psychologist, Detroit Public Schools
2. Brimhall, Dean R., Ph.D. Columbia University 1920
   Secretary-Treasurer of the Psychological Corporation
3. Brown, William M., Ph.D. Columbia University 1923
   Professor of Psychology and Education, Washington and Lee University
4. Freyd, Max, Ph.D. Carnegie Institute of Technology 1922
   Research Psychologist, J. Walter Thompson Co., 244 Madison Ave., New York, N. Y.

5. Fryer, H. Douglas, Ph.D. Clark University 1923
   Assistant Professor, Department of Psychology, New York University
6. Holsopple, Frances Quinter, Ph.D. University of Pennsylvania 1919
   Director, Department of Child Study, Rochester Society for the Prevention of Cruelty to Children
7. Koch, Helen Lois, Ph.D. University of Chicago 1921
   Adjunct Professor of Educational Psychology, University of Texas
8. Ludgate, Katherine Eva, Ph.D. University of Chicago 1921
   Instructor of Psychology, University of Minnesota
9. Merrill, Maud Amanda, Ph.D. Stanford University 1923
   Instructor in Psychology, Stanford University
10. O'Brien, Frank J., Ph.D. Clark University 1916
    Director, The Psychological Clinic, Louisville, Kentucky
11. Plant, James S., M.D. University of Pennsylvania 1918
    Director, Essex County Juvenile Clinic, Newark, N. J.
    "In view of his having had the equivalent of Ph.D. work and in view of his publications."
12. Porteus, Stanley David
    Professor of Clinical Psychology and Director of Psychological Clinic, University of Hawaii, part time, and Director of Research, Vineland Training School, part time.
    "In view of his published contributions"
13. Ream, Merrill Jay, Ph.D. Carnegie Institute of Technology 1921
    Asst. Supt. of Agencies, Mutual Benefit Life Insurance Company, Newark, N. J. (In charge of personnel research)
14. Taylor, Grace Adelaide, Ph.D. Columbia University 1923
    Lecturer, Teachers College
    Research Assistant in Institute of Educational Research, Teachers College, Columbia University
15. Tendler, Alexander D., Ph.D. Columbia University 1923
    Case Consultant, Jewish Board of Guardians
    Psychologist, Nerve Clinic of Post-Graduate Medical School and Hospital, New York

The report of the Committee on the Election of Officers was then presented as follows:

President for 1925, Madison Bentley, University of Illinois.

Members of the Council, 1925–1927, L. L. Thurstone, University of Chicago; S. W. Fernberger, University of Pennsylvania.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council, L. M. Terman, Stanford University; M. F. Washburn, Vassar College.

The following recommendations from the Program Committee were then presented:

The Program Committee voted to recommend to the Council and to the Association that, in view of the large number of papers submitted for the program by members of the Association, joint meetings with other societies except those with Section I of the A.A.A.S. and symposia be discontinued. The Committee without submitting a recommendation would like to open the question of the possibility of a four-day session of the Association.

The Program Committee also voted to recommend to the Council and to the Association that the organization of Round Table Conferences be encouraged as much as possible and that increased provision be made for such conferences.

The Council recommended that owing to the crowded condition of the program, symposia and joint sessions with other societies excepting Section I of the American Association for the Advancement of Science be discontinued and that the Association continue to meet in a three-day session. After some discussion of the recommendations of the Program Committee and the Council it was voted that the report of the Program Committee be laid upon the table and that the whole matter of the program of the Association be referred to the 1925 Program Committee with instructions to submit recommendations at the 1925 business meeting with reference to the improvement and organization of the program.

The report of the Standing Committee on the Certification of Consulting Psychologists as printed on page 80 was then presented. On recommendation of the Council it was voted to accept the report of the Committee.

On the recommendation of the Council C. S. Yoakum was elected to the Committee on Certification of Consulting Psychologists for the term 1925–1929.

No report from the Standing Committee on the Relation of Psychology to Public Welfare was presented. Mr. Maxfield, the Chairman, stated that nothing had been done by the Committee and that no matters had been referred to the Committee and hence no report could be submitted.

On recommendation of the Council it was voted that Mr. H. L. Hollingworth be elected a member of the Committee on the Relation of Psychology to Public Welfare for the term 1925–1929.

The report of the Committee on Library Check List of Psychological Books as printed on page 80 was next presented. On the recommendation of the Council it was voted that this report be accepted, its suggestions adopted, and the Committee be discharged with the thanks of the Association.

The report of the Committee on the Incorporation of the Association as printed on page 81 was next presented. On recommendation of the Council it was voted that the report be accepted, the suggestions contained therein be adopted, and that the Committee be discharged with the thanks of the Association.

The informal report of the Committee on a Section of Industrial or Applied Psychology as represented by an excerpt from a letter of the Chairman, J. McKeen Cattell, dated November 26, 1924, was presented. This excerpt reads as follows:

"The Committee on a Section of Industrial or Applied Psychology has no formal report to make. We have, as instructed at the last meeting, arranged a program for Washington and are ready to continue to do so in coöperation with the Committee on Program. As already reported we regard a section of industrial or applied psychology as desirable, but do not urge immediate action. It seems that it should be taken up in connection with other possible sections and should consequently be considered by the Council or by a general committee on sections of the Association."

On the recommendation of the Council it was voted that the report be accepted and the Committee discharged with the thanks of the Association.

The report of the Committee on the Establishment of an Associate Grade of Membership as printed on page 82 was then presented. The Council recommended the acceptance of the report and the adoption of its provisions with the addition of the word "professional" in paragraph two before the word "work." It was voted to adopt the recommendation of the Council to amend the report by the addition of the word "professional" before the word "work" in paragraph two. There then ensued considerable discussion of the second sentence in paragraph seven of the Committee's report relating to the right of associates to the floor at the annual meeting. It was voted to amend the report by deleting the phrase, "He shall have the right of the floor at annual meetings." It was voted that the report of the Committee as amended be accepted and its provisions adopted.

On the recommendation of the Council it was voted to adopt the changes in the constitution submitted as an appendix to the report of the Committee, the constitutional changes to be printed in the 1925 Year-Book for final action at the next annual meeting. On the recommendation of the Council it was voted to adopt the changes in the by-laws submitted as an appendix to the report of

the Committee effective upon the final passage of the constitutional amendments. It was understood that the Secretary was to make the changes in the appendix to the report of the Committee in order to make effective the amendments to the report of the Committee adopted by the Association on the previous motions.

The report of the Committee on the Relation of the Association to Publication as printed on page 83 was next presented with a Council recommendation that the report of the Committee be accepted and its provisions adopted. In order to make the provision of the report of the Committee effective the Council recommended the adoption of a constitutional amendment, changing the word "five" in Article 4 of the constitution to "ten" and changing the words "in advance" to the words "November 1st of the preceding year," making the sentence read, "The annual subscription shall be ten dollars payable November 1st of the preceding year."

In order to make the provisions of this report effective the Council also recommended the adoption of the following by-law:

By-Law 15

The Psychological Review Publications shall be conducted in the following manner:

1. A Board of Directors of five members of the Association, one of whom shall be the Treasurer, shall be appointed by the Council, each for a period of three years, with overlapping terms. The Directors are to supervise the financial conduct of the journals. If they believe that the editorial policy of the magazines is wrong or that they are too expensively conducted, they can, at any time, bring the matter before the Association or call the attention of the Council to the danger. They shall, however, have no direct control of the editorial policy of the magazines.

2. The Board of Editors shall consist of one editor for each magazine, whose term shall be a number of years corresponding to the numbers of editors on the Board. There shall be overlapping terms, one editor retiring each year. The Editorial Board as a whole shall nominate a successor to each position when a vacancy occurs, the nomination to be made to the Association through the Council. The Council either shall support the nomination or shall present to the business meeting of the Association the Board's nominee and also one other name which they also place in nomination. Any editor shall be eligible for reappointment. The functions of the editors shall be for each to conduct the journal assigned to him in conformity with the general policy of the Board of Editors.

3. The Council shall elect a Business Manager for a term of three years at a stipend from the budget of the jourjnals to be determined by the Board of Directors subject to the approval of

the Council. His functions shall be to administer the financial details of the journals in accordance with the policy outlined by the Board of Directors and to handle the finances of the publications. He shall submit an annual report to the Board of Directors, to the Council, and to the business meeting of the Association. He shall be bonded, the bond to be filed with the Secretary of the Association, for an amount to be fixed by the Board of Directors.

4. With the appearance of the Abstract Journal and the raising of dues to $10, the Treasurer shall turn over to the Business Manager $3 for each paid-up member of the Association and these only shall receive copies of the Abstract Journal.

There ensued considerable discussion with reference to the report of the Committee and the recommendations of the Council. It was voted to adopt the recommendation of the Council changing the first sentence in Article 4 of the constitution to, "The annual subscription shall be ten dollars payable November 1st of the preceding year," the amendment to be printed in the 1925 Year-Book for final action at the 1925 meeting.

It was voted to amend the report of the Committee and the recommendation of the Council with reference to the proposed by-law by deleting the provisions referring to the "Board of Directors" and substituting therefor the "Council of the Association" thus empowering the Council of the Association to act as the Board of Directors of the Psychological Review publications.

It was moved and seconded that the report of the Committee and the proposed by-law as recommended by the Council be amended to the effect that the Board of Editors be elected annually, the Secretary being empowered to make changes in the by-laws in accordance with this motion. After some discussion which emphasized the necessity of the devising of a flexible scheme for the control of the publications by the Association it was voted, upon the acceptance of a substitute motion, that all reference to the method of appointment and tenure of the Editorial Board be stricken from the by-law proposed by the Council and that the Secretary be empowered to change any conflicting phraseology in the proposed by-law. It was voted that the whole matter of the editorial administration be left to the Council for the year 1925 with power to act, the Council being instructed to report with a permanent plan for the editorial administration of the journals at the 1925 meeting of the Association.

It was voted that the report of the Committee and the by-laws proposed by the Council be adopted as amended.

On the recommendation of the Council it was voted that the

dues for Associates shall be six dollars a year payable November first of the preceding year, this provision to be incorporated in the changes in the constitution and by-laws as recommended by the Committee on an Associate Grade of Membership and the Council.

On the recommendation of the Council it was voted that the sum of $500 be drawn from the principal fund to be paid to Mr. Warren as first payment on the stock of the Psychological Review publications.

On the recommendation of the Council it was voted that the remainder of the principal fund be withdrawn from the Union Dime Trust and Savings Bank and placed in the general fund of the Association.

On the recommendation of the Council it was voted to delete By-Law 12 which deals with the administration of the principal fund, thus making its provisions ineffective.

On the recommendation of the Council it was voted that in case of emergency the Council be authorized to meet any extraordinary expenses in connection with the Psychological Review publications within the limits of its existing funds.

It was voted that the Committee on Publications be discharged with the thanks of the Association.

It was voted that wherever the word "six" occurs in the second paragraph of by-law one relating to elections, the words "not fewer than eight nor more than ten" be substituted.

The following resolution was voted:

That the National Research Council be requested to appoint in the Division of Anthropology and Psychology a Committee on Street and Highway Safety to aid in the correlation and facilitation of research on the Psychological problems of automobile traffic and control and the making available of the services of Psychologists to Government and other agencies dealing with traffic problems, further that the American Psychological Association promises to give this Committee its support and coöperation.

It was unanimously voted to extend to George Washington University and the Department of Psychology of George Washington University the grateful thanks of the American Psychological Association for the entertainment provided and the many courtesies received at the 1924 meeting of the Association in Washington.

The meeting adjourned at 11:00 p. m.

JOHN E. ANDERSON,
Secretary.

Report of the Treasurer for the Year 1924

Dr.

To Balance from the previous year	$999.92	
Dues received from members	2,218.26	
Sale of Monographs 51 and 53 in 1923	5.85	
Interest, October, 1923, to October, 1924	30.11	
		$3,218.18

Cr.

By Printing and supplies	$251.14	
Postage	87.00	
Reprints	134.74	
Year-Book	292.56	
Abstracts	69.34	
Incidentals of Madison meeting	6.83	
Apparatus Exhibit	9.76	
Election Committee	47.75	
Library Check List Committee	16.00	
Exchange	5.86	
Secretary's stipend	750.00	
Treasurer's stipend	50.00	
		$1,720.98
Balance in Fifth Avenue Bank	$718.03	
Balance in Union Dime Savings Institution	772.17	
Cash on hand	7.00	
		1,497.20
		$3,218.18

Account of Certification Committee

Dr.

To Received from Wells	$440.28	
Interest	5.88	
		$446.16

Cr.

By Diploma and supplies	$3.70	
Balance in Real Estate Trust Company	442.46	
		$446.16

Philadelphia, Pa.
December 15, 1924.

Samuel W. Fernberger,
Treasurer

Audited and found correct:
Warner Brown
R. Pintner
December 28, 1924

Budget for 1925

Printing and supplies	$400.00	
Postage	150.00	
Reprints	250.00	
Abstracts	100.00	
Incidentals of Washington meeting	100.00	
Apparatus exhibit	50.00	
Election Committee	100.00	
Year Book	300.00	
		$1450.00
Secretary's stipend	$750.00	
Treasurer's stipend	100.00	
		850.00
For first instalment for Psychological Review publications	$500.00	
		500.00
		$2800.00

Report of the Standing Committee on the Certification of Consulting Psychologists for 1924

The functions of the Committee have been in abeyance pending the readjustment of its relations to sections in applied psychology within the Association. One new certificate has been issued. The program of the Committee on Associate Membership will, if adopted, raise questions of certification of considerable importance, but the Committee reserves recommendations for the meeting following a positive action regarding associate membership. The Committee has no recommendations to bring before the Association at this time.

F. L. Wells
Executive Officer

Report of the Committee on Library Check List of Psychological Books

In view of the tenor of the replies received to its circular letter of 1923, your Committee incorporated the following paragraph in its report at the last meeting of the Association:

> "The Committee's intentions (for the year 1924) would be to concentrate on the problem of ascertaining which institutions are specifically strong in certain fields of psychological literature, and which would be willing to have it known that they will strive, so far as funds and other exigencies permit, to specialize on some more or less limited field of the literature, regardless of whether the books are old or rare. It will also try, in the interests of those who may wish to look up the history of psychological topics, to find out which institutions possess copies of older or rarer works, and which are specially strong in the literature of fields auxiliary to psychology."

In conformity with this statement of intentions, circular letters were sent this year to all the institutions to which the 1923 letters went, and to several others, making a total, for both years, of 104 different institutions. Replies have come in, for both years together, from 45 institutions. Of these 45, it appears that only 16 are, more or less definitely, either at present strong in the literature of some particular field of psychology, or willing to consider further specialization in one or more designated fields. The other replies were mostly negative in both respects, although a few (eight) expressed a willingness to consider concentration in some field that the Committee might designate in conformity with any plan that might be developed as a result of an analysis of the replies received.

To the third request of the Committee's circular, a request for list of rare or old books in psychology and related fields, or of special editions of such books, the need for which has been felt by individual investigators, but the location of which might not be generally known, I may say that only three replies came in, involving a list of nineteen titles.

In view of the small number of replies of positive import, and of the many types of difficulties cited by those who felt that their institutions could not undertake to specialize in limited fields of psychology, the Committee is of the opinion that it is not profitable at the present time to attempt further to develop any comprehensive scheme to ascertain and make known to the members of the Association (a) the names of institutions particularly strong in the respective fields of psychology, or (b) the names of those that will agree to specialize in any of such fields, or (c) lists of old or rare books, or editions, together with their location in the libraries of the country.

The Committee respectfully asks, therefore, that it be discharged, but offers for your consideration, two positive recommendations:

1. That it be authorized, provided that the Chairman secure the consent of those who sent in positive replies, to publish in the *Psychological Bulletin* the data that have so far been received.

2. That the Chairman be authorized, in submitting this information for publication, to urge members of the Association to supplement it by sending to the *Bulletin*, for announcement, similar information on behalf of their own institutions.

In this way it is not impossible that the members may, under the incentive of the actual publication of the data now on hand, be prompted to make the *Bulletin* a medium of valuable information along the three lines indicated.

ROSWELL P. ANGIER
Chairman

REPORT OF THE COMMITTEE ON INCORPORATION FOR 1924

At the Madison meeting of the Association the Committee was instructed to proceed with the incorporation in the District of Columbia, reporting for the Council's approval the proposed draft of the charter. The Secretary of the Association was requested to coöperate with the Committee and there was a conference in the office of the chairman at which Dr. William M. Marston was present and assisted in framing the charter. The bill incorporating the

Association was presented in the Congress by Senator Lodge and Representative Tilson, but has not yet been acted on. In case there is difficulty in enacting the bill, as has been the case on previous occasions, it is recommended that the Association be incorporated in the District of Columbia without special act of Congress. The chairman of the Committee thinks that arrangements for the incorporation can best be made by the Secretary in coöperation with the Council and suggests that the Committee be discharged, though it would be ready to act in an advisory capacity, or to do anything within its power to assist in the arrangements for the incorporation.

J. McKeen Cattell
Chairman

Report of the Committee on the Establishment of an "Associate" Grade of Membership

Your Committee are unanimous in the opinion that the purposes of the Association will be served by the creation of a class of Associates, under the limitations hereinafter described. The growth of the science of psychology has considerably advanced the stage of accomplishment at which the fundamental requirements of membership are met. Simultaneously it has created distinct groups of persons engaged in psychological work of a scientific character at less advanced levels, or in psychological work which does not involve research. It has also created closer relationships with other scientific fields. Your Committee are of the opinion that it is expedient to admit to associate status the above indicated classes of persons.

Embodying these principles, your Committee recommend action by the Association as follows:

1. The Association shall create a class of persons to be known as Associates of the Association. Associateship in the Association shall be distinguished from Membership in the Association.

2. Individuals belonging to any of the following groups shall be eligible to become Associates:

   a. Any person devoting full-time to work that is primarily psychological;
   b. Any person with the degree of Doctor of Philosophy, based in part upon a psychological dissertation and conferred by graduate school of recognized standing;
   c. Scientists, educators, or distinguished persons, whom the Council may recommend for sufficient reason.

3. The initiation of the election of an Associate shall be by application of the candidate to the Secretary of the Association. This application shall be made before October 1 of the year of election. It shall be supported by two independent endorsements made by Members of the Association. The form of the application and endorsements shall be determined by the Council, but both application and endorsements shall give as much pertinent information as possible concerning the psychological competence and interest of the candidate.

4. The Council shall consider all applications for Associateship and shall recommend to the Association such candidates as it believes will advance the

purpose of the Association. The Council shall make its recommendations to the Annual Meeting, which elects.

5. The annual dues of an Associate shall be three dollars, payable in advance. Nonpayment of dues for two consecutive years shall be equivalent to resignation.

6. Election of an Associate shall not be effective unless the initial dues are paid within three months after the action of the Association.

7. An Associate shall be entitled to receive the printed matter now distributed to Members as such, except that pertaining to elections. He shall have the right of the floor at the annual meetings, and may participate in the programs of the Association in so far as the Program Committee may provide for such participation. An Associate shall not be entitled to vote or hold office, or to any other privileges of Members, except those above provided for, and such as may hereafter be extended through action of the Members in accordance with the Constitution and By-Laws.

8. Associates shall be listed in the Year Book of the Association; but the typographical style of an entry for an Associate shall be distinctly different in appearance from that for a Member. The item for an Associate shall include all the information contained in an item for a Member, except that, instead of a specific designation of fields of instruction and of research, there shall be entered a general designation showing the Associate's primary scientific interest or interests.

9. An Associateship may be terminated at any time by a majority vote of the Members at any Annual Meeting upon recommendation of the Council after investigation.

10. In considering the establishment of the grade of Associate as defined above, the Association should keep in mind the possibility that the number of Associates may in a few years equal the number of Members. Your Committee, however, do not consider it desirable at the present time to limit the number of Associates.

11. It should also be kept in mind that, in the event of the Association's acquiring the Psychological Review Publications and including a subscription to an abstract journal in its dues for Members the Association will also have the right to make subscription to an abstract journal mandatory upon such Associates as may desire to continue their Associateships under such conditions.

In order to render the provisions of this report effective your Committee further recommend changes in the Constitution and By-Laws as indicated in the appendix to this report.

FREDERIC LYMAN WELLS
WALTER S. HUNTER
EDWIN G. BORING, *Chairman*

October 1, 1924.

REPORT OF THE COMMITTEE ON THE RELATION OF THE ASSOCIATION TO PUBLICATION

At the meeting of the Association on December 27, 1923, this Committee was instructed "to consider ways and means by which the Association might take up Mr. Warren's option and administrate the journals"; "to obtain the

sentiment of the Association with respect to the various possibilities by a mail vote," and "to make specific recommendations to the Association at the 1924 meeting."

On March 18, 1924, Professor Warren offered to waive the accumulated dividends, thus reducing the purchase price named in the option to five thousand five dollars.

Your Committee met on April 18, 1924, the Secretary and Treasurer of the Association being present by invitation, and formulated the plan for financing the purchase of the Psychological Review Company's stock which this autumn was submitted by mail to every member of the Association for an expression of opinion.

The results of this mail canvass were as follows:

Unconditional approval of both propositions	217 votes
Unconditional disapproval of both propositions	37 votes
In favor of purchasing the journals, but not of raising the dues to ten dollars	12 votes
Not in favor of purchasing the journals, but if they are bought increase of dues to ten dollars approved	2 votes
Undecided about buying journals, but disapproving of increased dues	4 votes
Undecided about both proposals	2 votes
Indifferent as to purchase of journals, but opposed to ten dollar fee	1 vote
Approval of both proposals, but thinks $5 high for general expenses	1 vote
Approval of both proposals, if Associate plan is adopted	1 vote
Approval of both proposals, if fees are reduced for retired members	1 vote
Approval of first proposal, no vote on second	3 votes
Total	281 votes

At the meeting on April 18 it was voted also to authorize the Chairman to submit to the Committee on Abstracts of the Division of Anthropology and Psychology of the National Research Council a request for a subsidy for the Journal of Abstracts. This the Chairman did, and the Chairman of the Committee on Abstracts appointed a sub-committee on ways and means which now has the matter under consideration.

In view of the results of the mail vote, reported above, your Committee recommends to the Association for adoption the following proposals:

1. That the Association by January 1, 1925. take title to the Psychological Review Company's stock.

2. That it authorize the payment, from funds now in the treasury, of five hundred dollars to Mr. Warren by January 1, 1925.

3. That it issue ten notes of the denomination of five hundred dollars each, bearing interest at 5 per cent annually, the first note to become due January 1, 1927, and one note of five hundred dollars to become due each succeeding year until the total debt has been paid.

4. That on January 1, 1926, an increase of two dollars be made in the annual dues, in order to continue payment for the Psychological Review Company's stock.

5. That as soon as possible the Association begin the publication of a Journal of Abstracts of twelve numbers per year, to be given free to the members of the Association.

6. That on January 1, 1926, the annual dues of the Association be increased by three dollars in order to pay for the publication of the Journal of Abstracts.

It was also voted to suggest to the Association in case the purchase is approved, the appointment by the Council of a board of directors consisting of five members of the Association, one of whom should be the Treasurer of the Association, and the selection by the Council of a business manager who should receive a stipend of $1,000 a year, including clerical assistance. The members of this board should be appointed for a term of three years with provision for overlapping terms.

In regard to the selection and functions of the editorial board, it was voted to submit to the Council a statement which has been sent by Mr. Warren to your Committee, and to recommend that the principles set forth by Mr. Warren be accepted by the Association. Mr. Warren's statement is as follows: "If the Association votes to purchase the stock, I shall recommend that the term of office of the several editors be made a definite period, namely, five years, or six years if a separate abstract journal be started and a sixth editor be chosen. I will suggest that the term of effice of the present editors be arranged by lot so that one term expires each year. I will also suggest that the editorial board as a whole nominate a successor to each position when a vacancy occurs, the nomination to be made to the Association through the Council; the Council will support the nomination or recommend some other name if they disagree with the board. Naturally, any editor will be eligible for reappointment.

"If this plan be adopted, the directors of the Review Company" (the Association) "will have no direct control over the editorial policy of the magazines. The directors, however, if they feel that the editorial policy of the magazines is wrong, or if any of the magazines are too expensively conducted, could at any time bring the matter before the Association, or call attention of the Council to the danger. I believe this plan will work out as well as any that can be devised. It might be well, especially at the start, to appoint one or two of the present editors (they are also directors of the Company) as directors of the Company under the Association. Possibly it might be well also to have one member of the Council beside the Treasurer on the Board of Directors, and to have also someone who is affiliated with the *American Journal of Psychology* as director, so that it will be recognized that this move is not inimical to the interests of the American Journal."

It is the opinion of the Committee that the policy of the Association and of the Directors should be to pay the debt as quickly as possible; and that when it is paid, the question of reducing the annual dues should be brought before the Association for vote.

H. S. LANGFELD
M. F. WASHBURN, *Chairman*

LIST OF PAPERS

(Arranged Alphabetically by Authors)

1. F. H. Allport, The Measurement and Motivation of Atypical Opinion in a Certain Group.
2. J. E. Anderson and A. H. Smith, The Effect of Quantitative and Qualitative Stunting upon Maze Learning of the White Rat.
3. James R. Angell, The Institute of Psychology.
4. E. W. Atkins, The Efficiency of the Eye Under Different Intensities of Illumination.
5. G. T. Avery, The Congenital Responses Exhibited by Prenatally Delivered Guinea-Pigs.
6. G. E. Bird, An Objective Humor Test for Children.
7. E. G. Boring, Intensity and Volume in Relation to Auditory Theory.
8. F. A. Bott, The Law of Orientation in Stereoscopy.
9. W. H. Burnham, The Man, G. Stanley Hall.
10. Trigant Burrow, The Need of an Organismic Conception of the Insanities.
11. H. E. Burtt, A Study of Trade-Name Infringements.
12. Hulsey Cason, Some General Characteristics of the Conditioned Response.
13. G. E. G. Catlin, The Decline of Liberalism in England.
14. L. W. Cole, Interference of Related Mental Process.
15. J. F. Dashiell, The Learning by White Rats of an Inclined Plane Maze.
16. H. S. Dennison, The Need of an Applied Psychology of Organization.
17. F. L. Dimmick, The Classification of Odors.
18. E. A. Doll, Recent Progress in Clinical Psychology.
19. J. E. Downey, Some Observations on Laterality of Function.
20. Knight Dunlap, Instincts and Desires.
21. Gladys Dykes, The Development of the Capacity to Observe from Ages Eight to Twenty-two.
22. E. A. Esper, An Experimental Technique for the Investigation of the Development of Linguistic Categories.
23. C. E. Ferree, A Spectrum Color-mixer, an Acuity Apparatus, and an Apparatus for Testing Astigmatism.
24. T. R. Garth, The Intelligence of Full Blood Indians.
25. A. I. Gates and G. A. Taylor, The Transfer of Training and Its Effects upon Growth in Young Children.
26. G. S. Gates, A Test for Ability to Interpret Facial Expressions.
27. R. H. Gault, Progress in Experiments on Tactual Interpretation of Speech.
28. L. R. Geissler, Descriptive Responses to the Human Face.
29. Arnold Gesell, Monthly Increments of Development in Infancy.
30. C. R. Griffith, A Photographic Study of Compensatory Limb Movements in the White Rat.
31. H. L. Hollingworth, When Is a Man Intoxicated?
32. George Humphrey, Is the Conditioned Reflex the Unit of Habit?

33. W. S. Hunter, The Subject's Report.
34. G. B. Johnson, A Study in Learning to Walk a Tight Wire.
35. H. M. Johnson, A "Fundamental" Postulate Which Psychology Can Do Without.
36. C. H. Judd, Psychology of Social Institutions.
37. J. R. Kantor, The Significance of the Gestalt Conception in Psychology.
38. F. A. Kingsbury, Defining Degrees in Rating-Scales.
39. H. D. Kitson, A Statistical Study of Vocational Histories.
40. K. Koffka, Some New Experiments on Visual Contrast.
41. Christine Ladd-Franklin, Fundamental Knowledge Regarding the Color-Sensations.
42. H. S. Liddell, A Moving Picture of Sheep and Goats Running a Maze.
43. F. H. Lund, The Emotional and Volitional Determinants of Belief.
44. W. M. Marston, Emotional Correlates of Autonomic Antagonisms.
45. H. W. Martin, A Radical Modification of the Maze Problem.
46. W. R. Miles and Eugene Shen, Photographic Study of Eye Movements in the Reading of Chinese in Vertical and Horizontal Axes.
47. J. B. Miner, The Will-Temperament of College Disparity Students.
48. H. T. Moore, Intellectual and Emotional Factors in Radicalism.
49. H. K. Mull, The Acquisition of Absolute Pitch.
50. T. E. Nicholson, The Growth and Decline of Voluntary Motor Ability from Ages Six to Eighty-five.
51. R. M. Ogden, The Nature of Intelligence.
52. L. J. O'Rourke, Research in Federal Personnel Work.
53. Joseph Peterson, Comparisons of White and Negro Children in Certain Ingenuity and Speed Tests.
54. J. P. Porter, Comparative Results of Tests of Ideational Processes and General Intelligence.
55. S. L. Pressey, A Simple Self-Recording Double Action Multiple Choice Apparatus.
56. Morton Prince, Three Fundamental Errors of the Behaviorists and the Reconciliation of the Purposive and Mechanistic Concepts.
57. Gertrude Rand, A Discussion of the Quotient Method of Specifying Test Results.
58. Samuel Renshaw, Meyer's Equation of the Learning Function Applied to Maze Learning in Rats.
59. Edna Rickey, The Effect of Thyroid Variation on the Behavior of the White Rat.
60. A. A. Roback, Is a Superior Adult Test Practicable?
61. W. W. Rogers, The Formation of a Multiple-Habit Out of Disparate Activities.
62. Curt Rosenow, The "Use" of Correlation in Psychology.
63. E. S. Rudisill, The Effect of Instructions on Weight Judgments.
64. Clara Schmitt, The Sex Incidence of Feeblemindedness.
65. W. T. Shepherd, Concerning the Influence of Education and Environment on the Religious Ideas and Beliefs of Children.
66. Stevenson Smith, Race Differences in Hawaii.
67. H. M. Stanton, Measurements of Musical Capacities.

68. E. D. Starbuck, The Psychologist, G. Stanley Hall.
69. Rachel Stutsman, A New Scale of Performance Tests for Children from Eighteen Months to Five and One-half Years of Age.
70. P. M. Symonds, Notes on Rating.
71. E. J. Swift and J. A. McGeoch, An Experimental Study of the Perception of Filled and Empty Time.
72. M. S. Viteles, The Clinical Viewpoint in Vocational Selection.
73. J. E. W. Wallin, The Scaphoid Scapula and Mental Deficiency.
74. A. P. Weiss, A Methodological Change in Experimental Psychology.
75. Lightner Witmer, Clinical Psychology—Its Origin and Future.
76. H. T. Woolley, An Experimental Study of the Nursery School Child.
77. J. U. Yarbrough, Intelligence: Definitions and Neural Markings of "Kinds," "Types," "Levels."
78. R. M. Yerkes, Chimpanzee Ideation.
79. P. T. Young, A Preliminary Analysis of Psychoneural Set.

ABSTRACTS

MONDAY, DECEMBER 29, 9:30 A.M.

PROGRAM A

GENERAL PSYCHOLOGY

A Preliminary Analysis of Psychoneural Set. PAUL THOMAS YOUNG, University of Illinois.

A doctrine of psychoneural set is of fundamental importance to (a) the student of behavior, (b) the student of experience, whether he be of the traditional or newer *Gestalt* variety. To the student of behavior the term "set" designates a neuromuscular pattern which conditions reaction either immediately or after delay. To the student of experience "set" is an important condition of observed phenomena. It is implied in *Einstellung, Aufgabe,* instruction.

One and the same psychoneural set may condition movement and phenomenal experience at one and the same time. Hence a fully adequate doctrine of set would sink beneath the shallow waters of present-day psychology.

A particular set may be conceived in anatomical or physiological terms but its actual nature is largely hypothetical at the present time. Even though it is impossible to describe accurately the neural mechanisms of set it is possible to state logically, in words or other symbols, the significance of this or that particular set. The meaning of a psychoneural set may be expressed, understood, accepted, or rejected. The meaning may be conscious at one time; it may vanish at another time. When the conscious meaning of a psychoneural set is absent from experience the particular set may be shown still to be a condition of movement and of individual experience.

As an existence psychoneural set is beyond the phenomenal order. It is conceived in bodily terms. It is regarded as one of the important conditions of phenomenal experience.

The Significance of the Gestalt Conception in Psychology. J. R. KANTOR, University of Indiana.

In appraising the value of the *Gestalt* movement it is important to differentiate between its three phases, first as a distinct idea belonging

to a particular group of psychologists and program of experimentation, secondly as an idea generally applicable as a distinct mode of interpretation of psychological work, and thirdly as a new general scientific or methodological attitude.

As a particular school conception designed to combat and replace the sensationist school, we can accord slight merit to the *Gestalt* movement. How can value attach to a variation of a mentalistic doctrine if it handles materials the existence of which are not only disputed but absolutely impossible?

No more valuable is the *Gestalt* movement as a general interpretative scheme of all experimental work. If it is only an interpretation of and not the immediate occasion for experimentation it may at least allow other views to compete with it in interpreting the work done. Furthermore, claiming the *Gestalt* view as generally applicable to experimental work creates the presumption that possibly it is not any better related to the experimental work with which the *Gestalt* proponents directly connect it than other conceptions, or may not interpret such work nearly as well.

Quite a different significance attaches to the *Gestalt* movement as a general attitude toward scientific phenomena. Although not exclusively psychological in character, it is of considerable value for psychology since, because of it, *Gestalt* psychologists take a better attitude toward psychological phenomena than even they themselves realize. Instead of being improvers of mentalistic psychology they throw their work into an objective form. They describe in their experiments stimulus and response situations instead of any kind of psychic material.

Support for this interpretation we discover in various features of the *Gestalt* literature: (1) *Gestalt* adherents make perception into responses to objectively existing stimuli objects instead of a process of synthesizing mentalities. (2) Attention is not considered as a process accounting for the preferential existence of mental states, but an attitude of the reacting individual to qualities and structures in objective things. (3) Also, learning is taken to be an objective process of the organization of movements and responses rather than a condition brought about by the influence of psychic causes. We may well then consider the *Gestalt* movement to be of considerable importance in psychology, but for entirely other reasons than the adherents of the movement suppose.

The Institute of Psychology. JAMES R. ANGELL, Yale University.

1. The Psychological Institute of Yale University has been established to promote coördinated research in psychobiology, which shall converge on problems of human behavior.

2. The method adopted is the selection of a group of outstanding investigators who together shall fairly represent the major divisions of interest in this general field of inquiry.

3. It is planned that these scientists shall, so far as is possible without interference with individual initiative, supplement one another's resources and direct their investigations toward a coördinated program.

4. Although the members of the institute are obliged to do no teaching, they may, if they wish, offer courses in the Graduate School, and it is the definite intention that each shall take into his laboratory a small group of properly qualified students who may assist them in research or carry on their own research, under the direction of members of the staff. It is designed in this way to make the institute productive in the training of scholarly personnel, as well as in the discovery of new scientific facts and principles.

Instincts and Desires. KNIGHT DUNLAP, The Johns Hopkins University.

The conception of instincts as teleological classifications of activities seems to be in process of disappearance, hence, in considering the assertion that the desire as I have conceived it is merely the instinct under a new name, I shall have reference only to the instinct as McDougall has more recently described it.

The desire differs from the instinct in three important points:

1. The instinct is a force or energy which drives the animal to certain forms of activity: it is not a primary content or object for the consciousness of the animal itself. The desire, on the other hand, is a content for the animal which "has" it, on the level of a color, a pain, and hunger.

2. The instinct is a central factor, presumably having its locus in the brain. The desire, on the other hand, is a peripheral factor, with its locus in tissues outside the nervous system.

3. The instinct is really a "faculty" in the traditional sense of the term. The desire is not in any sense a "faculty."

Emotional Correlates of Autonomic Antagonisms. WILLIAM M. MARSTON, New York City.

Cannon and Sherrington state that "fear," "rage," and sexual orgasm are all accompanied by motor discharge into the thoracico-lumbar, or sympathetic division of the autonomic nervous system. But each of these emotions, as currently defined, discharges, at different times, into different, antagonistic branches of the autonomic. This suggests that emotions cannot be defined in terms of autonomic discharge.

But autonomic antagonisms can be understood in terms of activity or passivity of accompanying emotions. The bodily active phases of my suggested primary emotions, appetite and love, are invariably accompanied by discharge into the sympathetic. The passive aspects of these primaries invariably utilize the cranial-sacral divisions. The underlying principle of utility of autonomic antagonisms appears to be action *by* the organism, as opposed to action *upon* the organism.

The identical active element in both "fear" and "rage," as usually evoked and described, is an emotional setting seeking domination of environment by self. This primitive self-asserting mechanism, active appetite, is always accompanied by sympathetic discharge. Cannon's "fear" is largely composed of this element; but is given its characteristic emotional quality by conflicting impulses seeking antagonistic discharge. Active love, or emotional setting, purposing devotion of self to the love-object, constitutes the second emotional element accompanied by sympathetic discharge. But these aspects of emotional primaries tend to produce action *by the subject* upon his environment.

Cranial innervations accompany bodily incorporation of food; and, normally, accompany passive appetite, the emotional setting purposing such incorporation. In so far as cranial (vagus) discharge prevails, the subject gives himself up to the action of food upon his digestive glands, stomach contractions, and heart. This same inert surrender to a foreign object constitutes the characteristic element of true fear, and is similarly accompanied by vagus discharge. The giving-up motor setting is in constant conflict with active appetite, until the latter may be overwhelmed, sympathetic discharge cease, and vomiting, voiding of colon and bladder, or fainting may be brought about through ensuing overintense vagus discharges.

Sacral sex innervations accompany erection of external genitals, causing the organism, in just so far, to submit to its love object.

In passion, therefore, as during incorporation and fear, the environment is acting *upon the subject.*

Interferences with incorporation (digestion) and passion, due to sympathetic impulses overwhelming cranial-sacral, are correlated with active aspects of appetite and love, rather than with true fear.

The "Use" of Correlation in Psychology. CURT ROSENOW, University of Kansas.

The article really deals with a wider field, viz., the applications of the mathematical theory of probability in psychology. It will defend the use of these methods against their two worst enemies, viz., those who attempt to escape from the limitations of these methods by ignoring the limitations, and those who attempt a similar escape by belittling the methods.

It has been alleged that the coefficient of correlation is a general index of concomitant variation but does not refer directly to the specific individual. Consequently other methods have been put forward to remedy this alleged defect. It will be shown: (1) That the theory of correlation, as part of the theory of probability, deals with the individual more directly and more precisely than any other method in present use. (2) That it furnishes us with approximate statements of probability in precise numerical terms, not to be confused with statements of precise numerical values of probability. (3) That our best approximations leave much to be desired on the score of reliability. (4) That that is due to the variability of the facts and not to the theory of correlation, which remains the best tool we have. (5) That a great part of the utility of this tool lies in the protection it affords against the exaggerated claims of those who ignore the variability of the facts with which they deal. Thurstone's Method of Critical Scores will be criticized as an individual instance.

Although the argument is confined to the constants of the theory of correlation, it is applicable wherever statistical constants of any kind are used as measures of "validity" or "reliability." The argument will be developed in conjunction with a presentation of the methods used by the writer at the University of Kansas for exhibiting the degree of accuracy with which scholarship can be estimated on the basis of psychological tests.

MONDAY, DECEMBER 29, 10:30 A.M.

PROGRAM B

EXPERIMENTAL PSYCHOLOGY

A Spectrum Color-mixer, an Acuity Apparatus, and an Apparatus for Testing Astigmatism. C. E. FERREE, Bryn Mawr College.

The color-mixer is in the form of a comparatively simple attachment which can be used in connection with a spectroscope of the usual type. By means of it the following combinations may be made: (a) wave-lengths from any two parts of the spectrum—two color-mixing; (b) the complementaries red (655 μ) and green (491 μ) or yellow (580 μ) and blue (478 μ) with any other color in the spectrum—three color-mixing; and (c) the two pairs of complementaries, red and green, and yellow and blue, or any other pairs of colors spaced in the spectrum as are red and green, and yellow and blue—four color-mixing. The apparatus is designed so that the energy values of the lights may be measured and may be varied in finely graded amounts. This feature enables us to make quantitative comparisons of relative sensitivities with relative combining proportions for both the complementary and noncomplementary colors.

The acuity apparatus has the following features: (a) Any acuity object, acuity chart, astigmatism chart, tangent screen, etc., may be uniformly illuminated over its entire surface and the illumination varied in finely graded steps from high to low without any change in the color of the illuminating light. (b) By means of a slight modification which may be quickly made the apparatus can be converted into a device for changing by very finely graded amounts the size or visual angle of the test-object over a wide range. This change in size can be made throughout the entire range, if desired, without any change in the intensity of light; or the intensity of illumination for any size of test-object may be varied from high to low in a continuous series without any change in the color of the illuminating light. (c) The apparatus may be used for testing the light and color sense. (d) It may be used as a mixer for filter colored lights. Also by means of it the saturation and brightness of a single color or mixture of colors may be varied independently.

The astigmatism apparatus is designed especially to enable the quick and accurate location of the meridian of an astigmatism. The determination derives its quickness and precision from the fact that

the judgment required is in terms of alignment, not sharpness or clearness of seeing.

Fundamental Knowledge Regarding the Color-Sensations (Hitherto Invisible to the Psychologists). CHRISTINE LADD-FRANKLIN, Columbia University.

It is only by means of the well-known logical device of *shutting the eyes* to the facts that are irreconcilable to views one is inclined for some reasons to hold that the followers of Helmholtz and of Hering (one should say, rather, of Thomas Young and of Leonardo da Vinci) have been enabled to maintain for so long a time their respective positions. The psychologists are well aware that vision, in its final psychical stage (and hence also in, at least, its cortical correlate) is tetrachromatic. Their blindness, which I have to combat to-day, consists in failing to have discovered that, nevertheless, the initial retinal photochemical process is a *tri-receptor* process. This latter fact has been put beyond question by the magnificent work of Artur König,[1] and the actual distribution through the spectrum of the three receptor photochemical nerve-excitant products has been determined by him. The absolutely definite nature of these results of König's has been largely overlooked, even by the physicists, owing no doubt to the fact that they have accidentally been left out, by Nagel and v. Kries, from the third edition of Helmholtz's great work on Physiological Optics, to the English translation of which the Optical Society has now invited me to contribute an appendix. It is this work, and its immense significance for the understanding of color, that I have devoted much space to reproducing, and that I hope to make comprehensible to you in the paper which I present to-day.

Some New Experiments on Visual Contrast. K. KOFFKA, (Giessen) Cornell University. (By special invitation of the Program Committee.)

In forming their theories of color contrast, Hering and Helmholtz were influenced both by facts and by theoretical prepossessions. While Hering believed the evidence of his eyes in taking contrast-colors to be sensory events just as real as any others, he was influenced by fundamental assumptions in denying the efficiency of the conditions stated by Helmholtz. Helmholtz, on the other hand, relied upon the observation of these conditions, and followed his theoretical

[1] Die Grundempfindenungen, etc.; Gesammelte Abhandlungen, 1903.

convictions in referring contrast-effects to the realm of judgment. Common to both is the concept of sensation, which for Helmholtz means a univocal point to point correspondence between stimulus and receptive process; for Hering, a no less univocal correspondence between the receptor-process and the geometrical distribution of hues and shades over the retina.

In giving up this assumption, the *gestalt* theory undertakes to explain all the facts advanced in favor of either of the two conflicting theories. It is maintained that our psychological reactions to the outer world do not form a sum of single processes, but an articulated whole-process. Consequently the distribution of hues and shades on the retina, considered as a mere geometrical pattern, does not furnish us an adequate basis for the understanding of the distribution of color in our phenomenal field of vision; we must also know the figural construction of this field of vision.

This contention is first demonstrated by Wertheimer's ring-contrast, where, without a change in the retinal pattern, the color changes according to the figures perceived.

A new factor appears in Wertheimer's cross-triangle experiment, quantitatively investigated by Benary. Here the color induced in a particular field depends upon the "appertainance" of this field to some other field, and changes as its "appertainance" changes. Since in this experiment the two fields constitute a "figure" and a "ground," respectively, the question arises whether a contrast-effect caused by a ground would be as strong as one aroused by a figure. Experiments carried out in my laboratory at Giessen indicate that a figure induces a stronger contrast than a ground. In a final experiment a Rubin-cross is used to induce color-contrast, and it is found that the figure becomes more readily colored than the ground.

These experiments, besides helping to decide the special issue of contrast theories, offer new evidence concerning the fundamental laws of all perceptive experience, and prove that contrast, far from being a curious phenomenon, is only a special case of a universal law.

Intensity and Volume in Relation to Auditory Theory. EDWIN G. BORING, Harvard University.

If we accept the all-or-nothing principle of nervous excitation (Adrian), the intensity of a sound must depend upon the number of nerve fibers affected. These fibers pass from both ears to each hemisphere, and we must assume further that there are in each auditory

cortex two adjacent overlapping regions of distribution, one for each ear (Watt). The resultant multiplicity of impulses integrates in the cortex, it would seem, by determining the density of ion concentration, the immediate correlate of sensory intensity (Köhler).

This view forces us to a frequency theory of hearing, and implies that the refractory period of auditory fibers must be only about one-sixteenth of Adrian's value.

Conscious processes would seem to run a definite course of cumulation and decay, presumably corresponding with normal diphasic excitation. The limitation of the range of attention must mean that excitations in the cumulative phase inhibit later excitations. Moreover, as against the total ion concentrations there presumably must be partially reciprocal inhibitions.

Finally, localization of sound, as associative, must depend upon the locus of the cortical excitation, or, in the case of diffuse excitation, upon the median locus.

Such a mechanism would account in diotic stimulation for the inhibition of a consequent sound by a prior (Hornbostel and Wertheimer). Simultaneous diotic sounds would give rise to a fusion of excited regions and thus to median localization, whereas priority of one sound would shift localization in the corresponding direction by partial or complete inhibition of the consequent.

Moreover, since by the all-or-nothing principle a tone gives rise only to a succession of discrete impulses, the "phase theory" of localization becomes a special case under the "time theory."

The "time theory" in turn is a special case of the "intensity theory," for time differences create intensive differences by inhibition. Simultaneous diotic sounds of different intensities, or their physiological equivalents in terms of time or phase differences, shift the median locus of ion concentration toward the region of the stronger sound.

The volume of a medianly localized diotic sound should be greater than the volume of a laterally localized diotic sound. This presumption is verified for median and intermediate localizations (Halverson); and the finding for lateral localizations would follow if partial reciprocal inhibition occurred. Volume thus plays the rôle of a true spatial attribute of tone.

The Classification of Odors. FORREST L. DIMMICK, University of Michigan.

Henning's prismatic classification of odors promised to solve some of the fundamental problems of the sense of smell. Three succeeding investigations have failed to show more than 30 to 40 per cent confirmation of the prism.

We extended our earlier experiment with the attempt to classify 100 additional odors selected from Henning's list. The variations among Os indicate no closer agreement with Henning than previous experiments have shown.

To test the validity of our method of classifying odors we classified a group of 100 colors by an exactly similar procedure.

We then selected two of the six standards and twelve odors that in the preceding experiments had been placed with greatest consistency in near relation to these two standards. With this easier task the Os improved their consistency with one another very little and proved relatively inconsistent with their own reports in successive observations.

It appears that Henning's classes are equivocal. Zwaardemaker's would do as well. We must give up classes of objects and establish strictly qualitative fundamental odors.

The Law of Orientation in Stereoscopy. E. A. BOTT, University of Toronto.

By means of a new type of flexible liquid prisms, juxtaposed stereoscopic views of any dimension and shown at any distance can readily be fused. With this convenient means of control it has been found that stereoscopic views do not require to be shown to a particular eye (*e.g.*, the left aspect to the left eye, etc.), as is usually assumed, in order to obtain full relief. On the contrary, stereoscopic views are ocularly indifferent provided that the law of orientation be fulfilled. This paper will cover: (1) A general statement of the law of orientation applicable to stereoscopic subject matter, as derived from experimental findings; (2) the range of tolerance that the eyes possess for fusing pictures in full relief when the conditions of presentation deviate from those required by the above law; (3) practical applications of these data in stereoscopy of motion pictures.

MONDAY, DECEMBER 29, 2:00 P.M.

PROGRAM A

GENERAL PSYCHOLOGY

A Methodological Change in Experimental Psychology. A. P. WEISS, Ohio State University.

In 1904, Professor Titchener described the object of the psychological experiment as that of yielding an "introspective acquaintance with the processes and formations of a given consciousness." Shall we, as Titchener seems disposed to do, extend the range of experimental psychology to include the experimental work in general, comparative, genetic, abnormal, and social psychology? If these fields are included it is obvious that the psychological experiment cannot be characterized as directed toward securing an "introspective acquaintance with the processes and formations of a given consciousness."

Since 1904, in the United States alone, nine periodicals have sprung into existence all devoted, to a greater or less extent, to the reports of experiments which have justified their classification under The Directory of American Psychological Periodicals. Of these nine periodicals six report experiments in the abnormal, social, comparative, and applied psychology, in which the introspective method is excluded by the nature of the subject matter. If we include experiments in education, mental tests, and measurements as belonging to the group of psychological experiments in so far as they are experimental, the introspective report of conscious processes would seem to be the exception rather than the rule.

It seems that during the last twenty years the experimental work of the members of the A. P. A. has become less introspective in character and is developing along the following three lines, to which the introspective method can contribute but little: (1) The neurological analysis of the sensorimotor components of human activity; (2) tracing a given form of human activity backward through its ontogenetic sensorimotor history to some infantile form of action; (3) tracing human actions backward through the social and institutional modifications of the activity to some earlier or primitive form.

Shall "psychological" be regarded as the proper adjective for this form of experimentation? Shall systematic psychology recognize in principle what is already recognized in fact?

The Subject's Report. W. S. HUNTER, The University of Kansas.

In the present paper introspection is compared with the objective method of the subject's report. Three forms of report are identified: (1) The response to stimulating conditions whose presence can be observed by other means than by observing the response; (2) the response to stimulating conditions whose presence is practically evidenced only by the existence of the response; and (3) language responses. Any behavior is a report when it is viewed as evidence for some of its determining or related conditions. What a given response will report depends, therefore, upon the interests of the experimenter. A sneeze, for example, may report "irritated nasal passages"; it may report "the individual's indifference to the solemnity of the occasion"; or it may serve only as an evidence of the integrity of the neural mechanism. The defenders of introspection as a scientific method usually deal with the third form of report, except where the behavior of infra-human animals is viewed as an evidence of the existence of "consciousness." I have indicated in previous papers how difficult it is to identify the specific language response, and yet such identification is necessary if language responses are to constitute the chief method of the science. In practice the subjectivists have used language responses as the objective criterion of "consciousness."

In all three forms of report the distinction should be drawn between a report *by* the subject and a report *to* the subject. Much is reported *by* the subject's behavior which is not a part of his irreversible *SP-LR* relationships (*i.e.*, of which the subjectivists say the subject is "unconscious"), and which is not, therefore, a report *to* the subject.

The method of the subject's report will be compared with the method of introspection as described by Calkins, Titchener, and Washburn.

The most reliable use of behavior in the science of human nature is not that which treats the behavior as evidence for some otherwise undeterminable phenomenon, but that which examines the behavior with reference to the verifiable conditions under which it arises. Where no independent check of a report's truthfulness is possible, the report is so unreliable that it is unfit for careful scientific use.

Three Fundamental Errors of the Behaviorists and the Reconciliation of the Purposive and Mechanistic Concepts. MORTON PRINCE, Boston, Mass.

The first fundamental error (of one type) of behaviorists is the assumption of epiphenomenalism leading to the denial of consciousness as the cause of bodily reactions. This is harking back fifty years to the "steam whistle" theory of Huxley. Even if we cannot understand the *how*, any doctrine which denies that consciousness determines behavior is in conflict with the basic principles of organized society and juridical law, such as the principle of "criminal intent," and will never be accepted by common sense people.

The second error is to suppose that behavior can to-day, if ever, be explained in terms of neural and bodily processes. It probably would be a great desideratum if it could be done, but we have not the faintest glimpse of the neural "patterns" awakened by the "adequate stimulus" and involved in behavior, or, any way, of discovering by objective methods what "patterns" did the job.

The third fundamental error of behaviorists is in confining themselves to only one method of observation and experimentation. As in the physical sciences, different problems require different and often many methods, according to the nature of the problem; so in psychology. The behaviorist, when he attempts to follow the "adequate stimulus" beyond the sensory receptors, runs up against a stone wall or loses his path in a jungle. Accordingly the behaviorist, whether he be a "steam whistler" or some other kind of parallelist, or an interactionist, or a pan-psychist, or some other kind of monist, is compelled by the hard facts of nature, willy or nilly, to shift to some other method after he has carried his objective method as far as he can; or else get nowhere. The only other method at present open to him is the introspective method, of which there are many kinds. (Watson's views are discussed at some length in this paper.)

The reconciliation of the purposive and the mechanistic concepts may be attained by the theory of the identification of the inner reality of neural processes with consciousness—a theory long maintained by the writer. According to this theory consciousness is the reality and neural processes the mode by which this reality is apprehended by a second organism. Accordingly it would follow that that which is experienced as will and purpose, if objectively apprehended through the senses, would necessarily be apprehended as mechanistic in terms of reflexes.

So when we think in terms of mind, we must think in terms of will and purpose; when in terms of physiology, in terms of mechanisms and reflexes. In *principle* it is immaterial which terms we use. Each has equal validity. Practically, however, as we know nothing about brain processes, we are compelled to explain causal antecedents of behavior in terms of mind, of will and purpose. (This theory is expounded at length in the paper.)

A "Fundamental" Postulate Which Psychology Can Do Without. H. M. JOHNSON, Ohio State University.

The superflous postulate is fundamental to nonbehavioristic systems of psychology. It may be stated thus: Each characteristic of experience is determined by a corresponding characteristic of response. The introduction is often made tacitly. It is then argued that if the response be adequately described, the value of each characteristic of the experience may be inferred from the description.

The aim of this paper is (1) to examine the postulate, and (2) to point out that the argument based on it involves a logical fallacy.

Certain authors suggest that the specific "qualities" (y_1) which one experiences at a given instant are determined by the specific effectors (x_1) or by the specific brain cells (x_1^1) which respond. Further, that "intensity" of content (y_2) is dependent on the energy of response (x_2). Moreover, that "clearness" of content, otherwise called the "degree of consciousness" (y_3), is determined by the total number of neurones (x_3) which discharge into the final common paths. (Not all authors make all these assertions, but the latter are typical.)

All such propositions reduce to the general form, $y = f(x)$, which means that each value of y depends, *in a manner which is not specified,* on the simultaneous value, or set of values, of x, and *vice versa.* However, to derive a particular value of y from a simultaneous value of x, the *form of this interdependence must be given.* In other words, $f(x)$ must be expanded, and numerical values assigned to the coefficients and exponents of x in the series. The conventional argument, cited above, implies that this operation has been, or can be, performed.

If both x and y represent actual quantities, the only way of determining the form of the relationship between them is by means of simultaneous measurements, other variables being rendered ineffective or their influence being corrected for. In physical sciences

the procedure is simple; in this case it is impossible, since the variable y is forever inaccessible to the experimenter. To argue that it is "expressed" by the subject's verbal responses implies that the relationship to be discovered is already known. The problem is to find the relationship between two variables, when only one, at the most, can be given.

Rejection of the postulate, or abstention from the logical fallacy, commits the author to objective description.

MONDAY, DECEMBER 29, 2:00 P.M.

PROGRAM B

SESSION FOR INFORMAL REPORTS BY GRADUATE STUDENTS

The Acquisition of Absolute Pitch. HELEN K. MULL, Harvard University, introduced by Edwin G. Boring.

The Effect of Instructions on Weight Judgments. EARL S. RUDISILL, University of Pennsylvania, introduced by S. W. Fernberger.

An Experimental Technique for the Investigation of the Development of Linguistic Categories. E. A. ESPER, Ohio State University, introduced by A. P. Weiss.

The Efficiency of the Eye under Different Intensities of Illumination. E. W. ATKINS, Johns Hopkins University, introduced by Knight Dunlap.

The Emotional and Volitional Determinants of Belief. FREDERICK H. LUND, Columbia University, introduced by H. L. Hollingworth.

The Formation of a Multiple-Habit Out of Disparate Activities. W. W. ROGERS, University of North Carolina, introduced by J. F. Dashiell.

A Radical Modification of the Maze Problem. H. W. MARTIN, University of North Carolina, introduced by J. F. Dashiell.

Meyer's Equation of the Learning Function Applied to Maze Learning in Rats. SAMUEL RENSHAW, Ohio State University, introduced by A. P. Weiss.

A Moving Picture of Sheep and Goats Running a Maze. H. S. Liddell, Cornell University, introduced by W. B. Pillsbury.

The Effect of Thyroid Variation on the Behavior of the White Rat. Edna Rickey, Ohio State University, introduced by A. P. Weiss.

Congenital Responses Exhibited by Prenatally Delivered Guinea-Pigs. George T. Avery, Stanford University, introduced by Calvin P. Stone.

A Study in Learning to Walk a Tight Wire. Granville B. Johnson, University of Denver, introduced by T. R. Garth.

The Development of the Capacity to Observe from Ages Eight to Twenty-two. Gladys Dykes, Indiana University, introduced by W. F. Book.

The Growth and Decline of Voluntary Motor Ability from Ages Six to Eighty-five. Thomas E. Nicholson, Indiana University, introduced by W. F. Book.

A New Scale of Performance Tests for Children from Eighteen Months to Five and One-half Years of Age. Rachel Stutsman, University of Chicago, introduced by Helen T. Woolley.

Tuesday, December 30, 9:00 a.m.

Program A

EXPERIMENTAL PSYCHOLOGY

Some General Characteristics of the Conditioned Response. Hulsey Cason, Syracuse University.

Some of the neglected aspects of the conditioned response are considered. When two stimuli act on the organism and call out two responses, there is some reason for believing that two conditioned responses may be formed instead of only one. Beginning with reflexes and " sensations," an attempt is made to explain the elementary learning processes involved in the acquisition of more complicated phenomena such as image, perception, meaning, association of

ideas, etc. To this end the conditioned response seems to have certain advantages which the other theories of learning do not possess.

When several connections between stimulus and response are exercised repeatedly, the general tendency is to increase the number of associations. When the number of responses associated with a single stimulus is increased, the situation is the same as in the redintegrative mechanism, which differs from a single conditioned response only in complexity. Some of the criticisms of the conditioned response and some of the claims for redintegration are discussed. On the whole, redintegration seems to be less supported by scientific evidence.

No theory can afford an adequate explanation of the more complicated forms of learned behavior, because many of the contributing factors cannot be observed. Negative adaptation seems to be a general characteristic of the nervous system, however, and learning is always the result of the activity of more than a single stimulus and a single response. Although the elementary schemes of learning do not afford an adequate explanation of the more complicated activities, it is desirable to consider these elementary processes whenever they can be identified.

Is the Conditioned Reflex the Unit of Habit? GEORGE HUMPHREY, Queen's University.

The conditioned reflex, as investigated by Pavlov, is often set up as the unit of learning or habit. A natural unit should be such that (a) it retains all the essential properties of that of which it is a unit, and (b) it cannot be further subdivided without losing some of those properties. As a unit of habit, the conditioned reflex seems not to meet the first condition.

Pavlov investigated the manner in which a single, originally indifferent stimulus comes to function for the biologically adequate stimulus in setting off a response. Such "conditioned reflexes" are characterized throughout the literature as possessing a universal tendency to extinction if unsupported by the primary stimulus, and even when well established they are inhibited with astonishing ease. These properties are not characteristic of the habits of everyday life.

The explanation for the discrepancy seems to lie in an overanalysis of the psychological "situation." The process of analyzing the situation into a "group of single stimuli" (Watson) and studying a reaction to such a single stimulus seems to have destroyed the

robustness and constancy which are characteristic of the habit and not of Pavlov's conditioned reflex. The latter is an artificial product, and behaves as such. There is also some evidence that a "situation" cannot be built up out of Pavlov's isolated stimulus by addition. Experiments to this end resulted at first in inhibition of the reflex, and when finally a complex stimulus was built up this showed a summative effect, not the redintegrative effect characteristic of the ordinary "situation." Further, attempts to explain such activities as maze running as a series of disconnected conditioned reflexes have up to the present been unsuccessful.

Habits depend indeed on substitution reactions, of which the simplest form is the conditioned reflex of Pavlov. This paper maintains that, valuable as are Pavlov's methods and results for the exhibition of certain elementary facts of habit formation, it is misleading to set up the conditioned reflex as a unit of habit or learning, and suggests further that if such a unit exists, it must be a mechanism of a more complex order, of which the conditioned reflex may perhaps be considered a limiting case.

The Effect of Quantitative and Qualitative Stunting upon Maze Learning of the White Rat. JOHN E. ANDERSON and ARTHUR H. SMITH, Yale University.

1. A group of female rats 32 days old were given 30 trials on a maze, three trials a day for 10 days. On the basis of their records they were divided into three equal groups of 18 each by pairing the time records for the entire 30 trials and the last 6 trials.

2. One group was used as a control and fed normally; the second group was stunted by feeding a diet chemically sufficient but of reduced calories; the third group was stunted by a diet quantitatively sufficient but qualitatively insufficient to maintain growth—gliadin being substituted for casein in the ration.

3. After an interval of 28 days, during which the stunting had taken place, the three groups were given 18 trials in original maze, 12 trials in a different maze, and 12 trials in the original maze, respectively.

4. All three of the groups were then placed on the standard diet, the stunted ones growing at a much accelerated rate.

5. After an interval of 28 days the second relearning trials were given, 12 on the original maze, 12 on the interfering maze, and six on the original maze, respectively.

6. The time curves for the experiments following the stunting

show that both qualitatively and quantitatively stunted rats are superior both in relearning the old maze and in learning a new maze to the rats which have grown at a normal rate.

7. The error curves of the experiments following the stunting show that the stunted rats are superior to the normal rats in relearning the old maze but inferior in learning a new maze.

8. Both the time and error curves for the experiments following realimentation show less discrepancy between the groups than do those obtained following the stunting.

9. An analysis of the curves shows that although the normal rats run more slowly they make fewer errors in proportion to their time in the maze than do the stunted rats. The quantitatively stunted rats make more errors in proportion to their time in the maze than do those qualitatively stunted.

A Photographic Study of Compensatory Limb Movements in the White Rat. COLEMAN R. GRIFFITH, University of Illinois.

The subjects of this experiment were put upon a small rotating platform and held near the axis of rotation by an inverted glass cup. A moving picture camera was set up nearby and exposures were made from the moment rotation began until the last of the compensatory movements had disappeared. A study of these movements shows (a) the way in which the tail is used as a compensatory organ, (b) the alternate and rhythmic extension and contraction of the limbs during the post-rotation period, (c) the compensatory positions of the body at successive moments during the whole period, and (d) the changes in compensatory movements which take place under repeated rotations.

The Learning by White Rats of an Inclined Plane Maze. J. F. DASHIELL, University of North Carolina.

A study was made to determine whether the white rat could learn a maze situation that offered no exteroceptive cues even to normal rats and could be learned only by some of the proprioceptors. The maze used was of simple design with three similarly built exit paths all leading from a common choice chamber, the principal distinguishing feature being its inclination at an angle of thirty degrees from the horizontal. At a given trial the exit leading to food was that one approached by an upward inclined pathway, the other two being locked: the animal's problem then being to learn always to take the upward inclined path from the choice chamber and not the down-

ward inclined one, nor the one continuing on the same level. This correct path varied between the right-hand, left-hand, and straight-ahead. Maze and direction of the inclination were rotated independently from trial to trial. Trials were given the rats twice a day for 100 successive days. Of the nine subjects used three showed clear progress in learning the problem. This was determined by different criteria: by percentage of errorless runs to total number of runs; by increase in number of errorless runs; and by improvement of score (elimination of errors and of excess time). Some interpretation of the results is offered.

Chimpanzee Ideation. Robert M. Yerkes, Institute of Psychology, Yale University.

This is merely an announcement of plan and intent. The proposed report is a summary of summaries which cannot well be further condensed. Following a declaration of independence of "fundamentalism" in behavioristic psychology, it is planned to present signal results of recent studies (Koehler, Ladygin-Kohts, Yerkes) of ideational behavior in the chimpanzee.

Interference of Related Mental Processes. Lawrence W. Cole, University of Colorado.

There has been agreement that identical elements cause transfer of the effects of training and especially that practice in addition will improve accuracy or speed (or both) in multiplication, because of their partial identity. Similarly practice in subtraction will improve division.

Instead of this, practice in addition caused loss of both speed and accuracy of multiplication, and practice in subtraction caused loss in accuracy in division and no gain in speed. Instead of improvement there was interference in these processes. Apparently the incorporation of a simpler process in a more complex one overcomes any improvement due to objective identity.

But practice in addition improved ability in subtraction and practice in subtraction improved addition. This is quite contrary to current theory. It indicates that objective identity has little to do with producing improvement and subjective identity has much to do with it. That this appears measurably in an experiment seems important at a time when objective conditions are being given all the weight and even association by similarity is not admitted as a factor

of economy of learning or productive thought. Experience as a subject in the experiment indicated that the subjective identities between addition and subtraction caused the spread of improvement, and that there was interference with the other processes. Twenty-six persons undertook the practice and the preliminary and final test. Three tables give the results. Later the experiment was repeated with twenty-four persons, fifteen of whom took both the practice test and the preliminary and final tests, and nine of whom took only the latter two tests.

The Transfer of Training and Its Effects upon Growth in Young Children. ARTHUR I. GATES and GRACE A. TAYLOR, Teachers College.

The improvement resulting from training is usually conceived to be due either to the development of specific techniques or to a direct increase in some mental power or capacity, or to both. There remains a possibility, at least in the case of children, that continuous training may stimulate the growth of capacities exercised. An effort was made to isolate and measure experimentally the effects of training in these three directions.

Children from four to six years of age were selected as subjects. For training were chosen two functions—tapping to represent motor ability and memory for digits to exhibit mental attainment—which would probably reach a relatively early maximum by dint of acquired technique alone. A practice and control group were given preliminary practice daily during about three weeks near the beginning of the academic year, after which the practice groups were trained on all school days throughout the entire school year. At the end of the year the control group was again practiced. Transfer tests were given to both groups at the beginning and end of the training period and repeated, together with tests of the function specifically trained, after an interval of about five months.

The data support the hypothesis that the results of training are mainly, if not exclusively, acquired techniques rather than increased capacity resulting directly from training or produced indirectly, by the acceleration of growth. The results suggest, moreover, that the acquired techniques are rather unstable and tend to disintegrate during a few months of disuse.

Some Observations on Laterality of Function. JUNE E. DOWNEY, University of Wyoming.

In the literature on right- and left-handedness we find a multiplicity of conflicting theories based upon facts accumulated in the light of a dominant theory, namely, that all except a small per cent of humankind is natively right-handed or right-sided.

Some investigators question this basal assumption and the accuracy of observations biased by its acceptance.

The degree to which dextrality is a matter of native rather than of acquired behavior is raised. It has been conjectured that possibly only a small percentage of mankind is natively right-handed and another small percentage left-handed, the majority of individuals acquiring laterality of function through training. The percentage of natively left-handed persons may be cited with some degree of confidence but not the percentage of right-handed, since in the latter case acquired and native behavior patterns are not separable. That to some extent native behavior patterns do exist seems guaranteed by heredity of left-handedness, by the sex differences in handedness, and by the age-long existence of a bias in favor of dextrality.

A second question concerns the sufficiency of a two-fold classification of humans into dextrals and sinistrals. The possibility of a number of types of laterality is being canvassed. The determining factor in classification of mixed forms varies from one investigator to another. Crossed forms may be thought to originate in the lack of harmony between the dominant eye and the dominant hand or in the relation of bimanual to unimanual preference.

The possibility that laterality of function is tied up in various of its aspects with intelligence level, speech disturbances, and temperamental bias has been suggested. Obviously the main problem—fundamental to all other inquiries and to accurate observation—is that of types of laterality.

The present report cites an attempt to get additional information concerning such types by questionnaire returns from members of the American Psychological Association and by reactions of college students.

The bimanual preference in connection with the unimanual appears promising as furnishing a method of classification; sex differences may give the clue to interpretation of the types revealed.

A Simple Self-Recording Double Action Multiple Choice Apparatus. S. L. PRESSEY, Ohio State University.

The apparatus presents the stimuli—which may be of almost any nature, including questions of the selective answer type as frequently used in intelligence tests—successively in a window. The subject reacts by pressing one of four keys. The pressing of the key turns up a new stimulus, and at the same time operates a counter if the reaction is correct.

By a simple shift of one catch the apparatus is so readjusted that a new stimulus is presented only when the correct reaction to the first stimulus is given, the counter counting *all* tries.

So data are presented indicating the comparative importance of these two methods—the distinctive merits of the method last mentioned.

The apparatus is entirely mechanical and key driven; there are thus no troublesome batteries or contacts to keep clean. It is believed to have distinct possibilities in facilitating laboratory experimentation, and to be capable of functioning as an automatic intelligence testing machine.

TUESDAY, DECEMBER 30, 9:00 A.M.

ROUND TABLE CONFERENCE ON CLINICAL PSYCHOLOGY

TUESDAY, 10:00 A.M.

PROGRAM B

SESSION FOR INDUSTRIAL PSYCHOLOGY

Notes on Rating. PERCIVAL M. SYMONDS, Teachers College.

Rating versus Ranking.—In order to test the relative reliability of rating versus ranking two teachers gave ratings on a graphic scale in seven traits and seven corresponding habits to a group of forty children which they both taught for thirty-five minutes every day. The traits and habits were selected for their prominence in school life and their availability for observation. A week later these two teachers ranked the same children on the same traits and habits. In order to eliminate practice effect two other teachers *ranked* and then *rated* another group of forty children. Correlations were found

between the ratings of teacher A and teacher B on each trait and habit. The same was done for the rankings. The average of twenty-eight rating coefficients was .438 and of twenty-eight ranking coefficients was .445. The whole experiment was repeated in another school with similar results. In a college class experiment rating and ranking the difficulty of words in spelling showed equal reliability. As far as reliability goes rating and ranking seem to be equally reliable. Ranking apparently does not force closer comparisons.

The Size of the Halo Effect.—Using the data from the first experiment described above, the ratings for each child were cumulated and used as a measure of the rater's general impression of each child. Second order partial coefficients of correlation were found between the ratings for any one trait or habit, with the composites for the two raters rendered constant. The seven trait ratings were lowered by .245 and the seven habit ratings were lowered by .177 by the halo effect. Obedience loses .423 with general impression made constant, cleanliness gains .083 with general impression made constant. Possible reasons for a large halo effect are: (1) The trait or habit is one which is not easily observed; (2) the trait or habit is one which is not commonly observed or thought about, such as one which is not usually emphasized in a classroom; (3) the trait or habit is not clearly defined; (4) the trait or habit is one which involves reactions with other people rather than mere personal behavior; (5) the trait or habit is one with high moral importance in its usual connotation.

Defining Degrees in Rating Scales. FORREST A. KINGSBURY, University of Chicago.

The crucial problem in constructing a practicable rating scale is to define reliably the various degrees of each trait under consideration. Many methods have been proposed, theoretically excellent but frequently unsatisfactory in practice.

Most rating scales have to be used by executives unaccustomed to think easily in quantitative terms of personal traits. Moreover, ratings are designed chiefly for use in practical situations by the same kind of executives, not merely for research by statistical experts. This is where methods fail which are based, for example, on defining the individual's position in an unmeasured group, such as the man-to-man scale, quintile divisions, or percentages of the normal distribution. Executives do not think in such terms, and can use them at best only in rechecking ratings already made.

This paper points out that ratings must be made in terms conformable to the raters' habits of judgment, and in terms of the situation in which they are made and the uses to which they are to be put. Since raters, situations, and uses vary, there is no one "best" form of rating scale.

In one highly departmentalized organization having about 1,700 employees, no definitions based on the performance of the general population or even of the entire office staff proved workable. Ratings had, therefore, to be made in departmental terms instead of all-office terms, and used accordingly. The following definitions of the five degrees were found theoretically defensible and practically comprehensible:

"1" means employee is so deficient in respect to the trait that he is being considered for transfer or dismissal.

"2" means employee is deficient in the trait and has had to be warned about it.

"3" means employee meets reasonably satisfactorily the actual departmental demands in respect to the trait.

"4" means employee stands out above general run of workers in the department.

"5" means employee stands out conspicuously above even the "4" degree men.

Used in conjunction with a program of analysis of ratings and training of raters, these definitions are yielding estimates in which increasing reliance is placed. They are found practicable for all departmental needs, including certain research purposes. When used interdepartmentally, any one of several experienced executives who know the differences between departmental standards can convert them into terms of an all-office standard. Statistical methods for such conversion are being devised.

The Clinical Viewpoint in Vocational Selection. Morris S. Viteles, University of Pennsylvania.

Scientific selection in industry has from its very beginning been dominated by a quantitative rather than by a qualitative viewpoint. Industrial coöperation has been solicited on the thesis that the selection of a competent man is merely a matter of converting performances into a quantitative score, the significance of which can as readily be interpreted by an employment clerk as by a psychologist. In Germany this point of view, exaggerated even more than in this

country, has led to the development of automatic recording devices in industrial selection in which the "personal equation" of a trained or untrained examiner is altogether neglected. It is time for the psychologists to take stock, to decide whether ultimate economy as well as the demand for scientific reliability do not call for a renewed emphasis on the clinical viewpoint in industrial selection—on an emphasis on selection by trained examiners based on a qualitative analysis of performances as well as upon a quantitative score. Incidentally this involves a consideration of the place of the psychologist in industry—as selection agent, as staff officer in an employment office, or as consulant in industry.

In vocational guidance the same question needs to be considered. Educators as well as psychologists are showing tremendous interest in this problem. They are carrying on extensive investigations based on the theoretical assumption that test score reveals personality—in its broadest sense. This must likewise be subjected to critical investigation with a view to determining the desirability and possibility for injecting the clinical vewpoint into scientific vocational guidance programs.

The Need of an Applied Psychology of Organization. HENRY S. DENNISON, Dennison Manufacturing Company, Framingham, Mass. (By special invitation of the Program Committee.)

So setting up a living organization of managers and men that the wills of the individuals composing it will run in parallel without undue friction is the fundamental task of managers of industry. The objective is a smoothly functioning piece of mechanism, rather than odd sized pieces of metal gathered in a miscellaneous heap.

There is a feeling that work in industry must necessarily be stupid. If true, this would focus effort upon developing a technique whereby (1) hours would be as short as possible and (2) wages would be high enough so that a worker's leisure might offer full opportunity for development. Comparatively an easy task, but of small value.

But it is not true. The real problem is to make each day's work of gripping interest.

Before it can be seriously attacked we need some statement of such knowledge as we have of the forces and resistances in working groups of men and of women.

(a) Those forces having relation principally to the intelligence—

knowledge of how to do one's work and of what the relation to one's work is to the whole job, and *imagination* of the possibilities of improvement;

(b) The group of incentives ordinarily known as the "economic" forces;

(c) The noneconomic incentives, such as pride, the various motives to serve, the creative tendencies, habitual mental attitudes, and the like.

In seeking the solution of these problems the tool most needed is a well developed, hard headed, brass tacks psychology.

A working program of organization psychology must deal with the conditions at hand. Such things as restraining the cave-man methods of foremen, training foremen in leadership, the meaning of authority, the proper introduction of the worker to his job, effects of the size of groups in relation to group action, effect of fatigue upon attitude, distrust, effect of irritation, anger, and fear upon fatigue, sources of emotional disturbances or suspicions in individuals and groups, differences in reactions of men and women, differences of reactions of adults and youngsters, of older and younger adults, and a grist of others, offer abundant points of attack. It is quite useless to rely upon the concept of an economic man as a ready-made answer.

Research in Federal Personnel Work. L. J. O'Rourke, U. S. Civil Service Commission.

Can psychologists who are engaged in personnel work make greater and more practical contributions as a result of their analysis of duties and qualifications? Such analysis is usually the basis for construction of tests to measure the qualifications essential for performing the given task according to the usual procedure. Before the work of devising measurements of qualifications for efficiency in certain duties is undertaken, should not more attention be given to determining whether or not those duties could be simplified. A case in point shows how, by slight change in the arrangement of the work, a task which required considerable native skill and two or three months of training was simplified to require very little skill, little or no training, and far less energy and strain. The output was increased and the effort required was reduced.

Greater emphasis should be placed on making tests not only look practical but be practical. More attention needs be given to study

of the ranges and distributions of scores, of the selective value of items, and of the intercorrelations as well as of the correlations of each kind of item with the criterion. Statistical nicety in combining tests may be a waste of time. Only after the tests to be weighted have been given such detailed preliminary trial and study should partial correlations be run and weights be assigned.

Studies of the relative selective values of intelligence tests and of special aptitude tests for the selection of distributors in the post office, and also for selection of railway postal clerks, are reported. Intercorrelations are based on 1,000 cases.

Weighting of a battery of post office tests to predict success in different assignments and to aid in promotion, placement, and training problems, is discussed.

A method of simplifying the correction of papers is reported. In addition to the saving made by the use of stencils and objective examination forms, there was effected a reduction of 50 per cent of the work and much of the eyestrain involved in scoring 27,000 papers in the railway postal clerk examination. This reduction was made possible as a result of a statistical study of the scores made by competitors and of the intercorrelations of the tests.

A Statistical Study of Vocational Histories. HARRY D. KITSON, University of Indiana.

It is frequently remarked by administrators of personnel and of vocational guidance that there is great need for the compilation of the vocational histories of homogeneous workers. The present investigation is an attempt to furnish such data concerning about 700 high grade office workers, the consecutive applicants during the past four years at a private employment bureau in a city of 350,000. The compilation of the intimate details regarding actual vocational careers permits answers to be given to a number of questions: Frequency of desire for change of vocation; time spent in previous positions; relation between last salary, salary desired, and minimum to be accepted; relation between amount of salary and education; relation between salary and length of time spent in each position.

Besides giving fairly conclusive answers to a number of such questions, the investigation demonstrates the usefulness of this type of research in the establishment of policies of vocational guidance and personnel administration, and points the way to investigation of other problems.

A Study of Trade-Name Infringements. HAROLD E. BURTT, Ohio State University.

The experiment was conducted in connection with a petition for injunction against the use of a trade name. Its aim was to determine the amount of confusion between the original name and the alleged imitation relative to the confusion between other pairs of names. It proved feasible to use the group method of experiment, projecting the names serially on the screen by means of a lantern and obtaining judgments on mimeographed blanks. The general method consisted of presenting a set of names (the presentation) followed by a second set (the test), which included duplicates and imitations of names in the presentation as well as new names. The imitations comprised names that had been litigated. The observers indicated for each name in the test whether or not they had seen it in the presentation. Marking a duplicate as " not seen," or marking a new name or imitation as " seen," indicated confusion. The name of the plaintiff's concern appeared in the presentation and that of the defendant in the test.

Under the conditions of the experiment a slight confusion (9 per cent of the observers) was found on the average for duplicates and new names. This might be termed " normal confusion," and indicates the general difficulty of the experimental conditions. The confusion for the names of the plaintiff and defendant proved to be 22 per cent—considerably greater than normal. The confusion for the other pairs of imitations which had been litigated was slightly greater still—30 per cent.

Evaluating separately the cases which had been judged infringements by the courts, the former averaged 30 per cent confusion and the latter 29 per cent. This indicates a rather slight correspondence between the court's decision and the actual psychological similarity between the names.

The technique developed in the present case would seem rather generally applicable to problems of trade name or trademark infringement. In many cases the court might profitably consider the actual amount of confusion between the two names or marks. This confusion can be measured objectively with unprejudiced observers in a reasonable time and can most validly be stated in terms of the normal confusion existing under the given experimental conditions.

TUESDAY, DECEMBER 30, 10:30 A.M.

ROUND TABLE CONFERENCE ON THE "GESTALT PSYCHOLOGIE"

TUESDAY, DECEMBER 30, 2:00 P.M.

PROGRAM A

JOINT MEETING WITH AMERICAN POLITICAL SCIENCE ASSOCIATION

PSYCHOLOGICAL BASIS OF CONSERVATISM AND RADICALISM

GEORGE E. G. CATLIN, Cornell University, of the American Political Science Association, *"The Decline of Liberalism in England."*

HENRY T. MOORE, Dartmouth College, of the American Psychological Association, *"Intellectual and Emotional Factors in Radicalism."*

FLOYD H. ALLPORT, Syracuse University, of the American Psychological Association, *"The Measurement and Motivation of Atypical Opinion in a Certain Group."*

TUESDAY, DECEMBER 30, 4:00 P.M.

PROGRAM B

EXPERIMENTAL PSYCHOLOGY

Measurements of Musical Capacities. HAZEL M. STANTON, University of Rochester.

For the past three years the Seashore Measures of Musical Talent have been given to the students of the Eastman School of Music. A graphic presentation of the results of these measurements for each student form a talent chart of musical capacities. A detailed individual questionnaire supplements the tests and furnishes valuable qualitative information.

Teachers' ratings are obtained for each pupil on the following

factors: apparent talent, musical feeling, rhythmic action, quality of tone, musical achievement, application, and health. These estimates by teachers further supplement the information regarding each pupil.

As a result of an intensive study of these measurements and teachers' ratings of apparent talent, the measurements are now a fundamental part of the entrance requirements of the school. Data will be presented for a total of 1,653 students.

Descriptive Responses to the Human Face. L. R. GEISSLER, Randolph-Macon Woman's College.

This is a continuation of a previously reported study of human photographs, involving (instead of interpretation of facial features) a systematic study of purely descriptive responses and their comparison with (1) certain objectively determined mental traits of the fifty persons pictured, as based upon their collegiate records, and (2) these same traits as subjectively estimated or interpreted by fifty judges. The description was based upon a prepared blank, enumerating eight major features which were subdivided into several typical items, each intended to be descriptive of the respective feature; for example, III. Eyes: (a) bright or sharp, (b) dull, (c) dreamy or languid, (d) ordinary, (e) unclassified. The observer was instructed to study the whole group of faces carefully and then to classify as many of them as possible according to the above mentioned features and their special characteristics by placing the number of the photograph to the right of those terms which best described the feature in question.

Under every major feature the "nondescript" items, "ordinary" and "unclassified" occur besides the several "distinctive" items. The algebraic difference between the frequency which a given face attains in the "nondescript" items, and the frequency with which it is mentioned under the "distinctive" items constitutes the general Index of Facial Distinctiveness, according to which all the photographs were ranked and then compared, by help of Spearman's foot-rule correlation coefficient, with their ranks in various mental traits, such as general scholarship, scientific ability, musical ability, artistic ability, literary ability, and neutrality.

The results show a few striking coincidences between objectively measured superiority in one or the other of these traits, and very "distinctive looking faces," the value for R being +.20, with a P.E. of .06; the corresponding R-value for subjectively estimated

mental superiority and facial distinctiveness is only $= +.08$, with a P.E. of .06. The separate comparisons of the eight major features with the objective and subjective ranking in each of the various mental traits, which we made in order to discover correlations between them, yield almost uniformly negative results. Other comparisons were made between the various features themselves, to discover whether any striking relationships exist among them, such as long, oval shape of face occurring with high forehead, etc., with indifferent success. These and other results confirm and extend the conclusions reached in the earlier study and help to explain why the human face is perhaps the most fascinating single stimulus calling forth the greatest variety of responses, and why statistical repudiations of the claims of physiognomy will appear like futile efforts to rationalize what seems to be a peculiarly human instinctive curiosity in the human face.

A Test for Ability to Interpret Facial Expressions. GEORGINA STICKLAND GATES, Barnard College.

Nine hundred and two school children ranging in age from three to fourteen and in grade from kindergarten to eighth grade, and eighty-six college students, were tested either individually or in small groups to determine their ability to interpret pictures (published originally by Rüchmick) representing various facial expressions. Among the results obtained were the following: (1) The ability was found to increase with age and grade at a fairly uniform rate; (2) a test consisting of ten pictures chosen from the group was constructed and scales of averages were obtained, so that it is possible to gauge any child's ability by finding his position in his age or grade group; (3) the probable order of difficulty for the various expressions was, from least to most difficult, laughter, pain, anger, fear, defiance, appeal, scorn, surprise, and a blending of sorrow and joy; (4) a correlation of scores obtained by the kindergarten children with other measures of these individuals resulted in a low coefficient (about .20) with chronological or mental age, and with estimated physical or mental maturity, and a considerably higher coefficient (from .40 to .60) with estimated social or emotional maturity.

When Is a Man Intoxicated? H. L. HOLLINGWORTH, Columbia University.

The presence of a drug influence may be indicated in human experiments (excluding chemical and physiological technique) by

three different sorts of evidence. These are: (a) Introspective reports of the subject; (b) observation, by a witness, of general appearance and conduct; (c) technical psychological measurement. Disagreement of expert testimony, as illustrated, arises in part out of the use of these different methods.

An experimental investigation of the accuracy and sensitivity of these three techniques shows that they differ very markedly, the order of accuracy being measurement, introspection, observation. In the present instance the third of these identifies only the largest dose and its effects, the second identifies the effects of small doses, the third correctly indicates the effect of doses smaller than any here employed.

Confirmatory evidence of the accuracy of the three techniques has already been reported from studies in which performer and witness judge the efficiency of performance in the case of the normal variations from average achievement.

For practical or legislative purposes the use of the poorest of these methods may afford useful criteria, but greater care than is now the custom should be taken not to confuse these rough observations with the final verdicts of science.

Photographic Study of Eye Movements in the Reading of Chinese in Vertical and Horizontal Axes. W. R. Miles and Eugene Shen, Stanford University.

As far as the investigators are aware, no photographic study of the eye movements in the reading of Chinese was ever reported before this attempt. Our study was made especially because Chinese is radically different from any European language. Characters are perfect squares, and each contains from one to more than thirty strokes. While traditionally the characters have been printed in vertical lines, a large number of recent Chinese publications have adopted the horizontal axis for alignment. The photographing of eye movements affords an excellent means of studying various problems in this connection. This report can only include preliminary findings on certain phases of the general problem.

The records have been made by use of Dodge's method of photographing the corneal reflection from the crater of a carbon arc lamp. The beam of light was interrupted by a synchronous motor so as to record in units of .02 second on strips of film 60 inches long by 2½ inches in width. The record represents a magnification of five times. A commercial camera has been found which is very convenient for

this and similar photographic recording. It moves the film continuously and evenly in any axis and has a considerable range of speeds.

The results show that the process of reading Chinese is essentially the same as that of reading English. With material of medium difficulty, a subject could by one fixation usually read more than one single character, the average being about two characters per fixation pause. The duration of each pause varied from .08 to .80 of a second, with .25 second as the approximate mean for most subjects. Individuals differed widely in respect to speed; on the average three to eight characters were read in a second. There was a slight indication that the vertical alignment was the more economical. The work so far has been handicapped by the difficulty of securing comparable reading material. The recent coöperation of a Chinese printing establishment makes possible our further and more exact investigation.

An Experimental Study of the Perception of Filled and Empty Time. EDGAR JAMES SWIFT and JOHN A. MCGEOCH, Washington University. Reported by EDGAR JAMES SWIFT.

The filled time was filled with copying nonsense syllables, uninteresting sense material, a passage from "Huckleberry Finn," and with listening to the reading of another anecdote from "Huckleberry Finn."

The 30″, 1′, 2′, and 5′ periods, both filled and empty, are overestimated by men and women irrespective of ages.

There seems to be no consistent difference between the estimation of empty time of these periods and the same intervals filled with listening to uninteresting material.

The amount of overestimation of 30″, 1′, 2′, and 5′ periods, both filled and empty, is greater than the amount of underestimation for the same periods.

The general average of correct estimates, in percentages, for these periods, both filled and empty, is greater for women than for men.

In the ten-minute period, variously filled, both men and women underestimated the time when they were copying either interesting or uninteresting material. Copying one of Huckleberry Finn's cleverest escapades had no more effect than copying dry sense material or nonsense syllables. All resulted in underestimation of the time, with copying nonsense syllables leading for the men.

But both men and women, on the other hand, overestimated the same period of time when they were listening to one of Mark Twain's

humorous stories. It may be said, therefore, that when the subject is doing something, even if the task is uninteresting, time seems shorter than when spent in listening to an interesting story.

But here, as in the case of the shorter periods, the general average of correct estimates is a little better for the women than for the men.

We therefore seem justified in saying that, under the conditions of this investigation, women have a slightly more correct feeling for time than have men.

Progress in Experiments on Tactual Interpretation of Speech. ROBERT H. GAULT, Northwestern University.

Since the accumulation of the data published in the *Journal of Abnormal Psychology and Social Psychology,* Vol. XIX, No. 2, July-September, 1924, this experimental work is being carried on in Washington under the auspices of the National Research Council.

Our subjects are sixteen students and one instructor in the Columbian Institution for the Deaf. The paper includes a description of these subjects as to age, life history, medical history, school status, auditory capacity, and lip reading ability.

For experimental purposes these subjects are placed in three groups. Two groups are attempting to learn sentences by touch and the experimenters are looking for evidence that capacity to discriminate words may be emerging. The third group is setting out with words as stimuli and is attempting to build them up into sentences.

Learning curves are described. These curves represent the progress of each subject in respect to the stimuli as a whole, and to the individual sentences and to the individual words. They are suggestive of elements that may, in future experiments, be profitably combined into new groups of stimuli.

TUESDAY, DECEMBER 30, 7:30 P.M.

SESSION IN MEMORY OF G. STANLEY HALL

Jointly with Section I of the American Association for the Advancement of Science

J. MCKEEN CATTELL, *Chairman*

The Man, G. Stanley Hall. WM. H. BURNHAM, Clark University.

The Psychologist, G. Stanley Hall. EDWIN D. STARBUCK, University of Iowa.

WEDNESDAY, DECEMBER 31, 9:00 A.M.

PROGRAM A

SOCIAL AND RACIAL PSYCHOLOGY

Psychology of Social Institutions. C. H. JUDD, University of Chicago.

Several books have appeared in the last three years bearing the title Social Psychology. These new books, like the Social Psychologies of McDougall and Ross, are very vague in their explanations of social consciousness as distinguished from individual consciousness. Apart from references to gregarious instincts or imitation or some other such abstract general notions, there is no effort to define what may be called the fusing or unifying force which holds together group consciousness. Until some clear ideas are developed which explain the unique character of social mental unity, social psychology will be nothing but individual psychology, with emphasis on those individual traits which are common to all members of the group.

The true function of social psychology is to describe those creations of group effort which the individual mind alone is unable to produce, such as language, money, weights and measures, customs and laws. In the study of these social and intellectual institutions there is a rich and almost unworked field for the psychologist.

One illustration will serve to make clear the whole matter. Primitive man has no means for measuring with exactness short intervals of time. After long experimentation in social coöperation men have devised the mechanisms which make possible what we call the social demand for punctuality.

The practice of punctuality, which arises through social coöperation, produces an effect on individual consciousness which is of a profoundly transforming type. Punctuality is not an instinctive trait; it is acquired under social pressure. As soon, however, as the individual conforms for a time to the social conventions, he becomes so habituated to punctuality that he demands that others conform also. The individual thus becomes the center for a social demand and an agent for the propagation of the established social institutions.

Other like examples can be adduced to show that social institutions are superindividual forces developed by coöperation. These forces are new facts in the world. They are impersonal and powerful in controlling individual behavior and individual mental processes.

They furnish the true explanation which ordinary social psychology lacks in its vague abstractions and in its emphasis on instincts.

Race Differences in Hawaii. STEVENSON SMITH, University of Washington.

Four nonverbal tests and three language tests were given to 7,000 children in the Honolulu public schools in the spring of 1924. Chart and pantomime presentation was used for three of the nonverbal tests. The entire population between 10.0 years and 15.0 years who were attending school when the tests were made are included. This population is made up chiefly of Japanese, Chinese, Portuguese, white, and Hawaiian children.

The evidence offered for and against the existence of innate race differences consists (1) in a comparison of the improvement-with-age curves of the various races for each type of test expressed in terms of S.D. of the total population of each age, and (2) a comparison of nonverbal test performance with language test performance, similarly expressed, for each race.

The inferiority of the Orientals to the whites appears to be due chiefly, if not entirely, to lack of opportunity, whereas this is not true of the inferiority of the Hawaiians and the Porto Ricans.

The Intelligence of Full Blood Indians. THOS. R. GARTH (Assisted by T. J. Serafini and Dewey Dutton), University of Denver.

Problem: To obtain the median approximate I.Q. of a large group of Indians recognized as full blood Indians by the U. S. Government; to ascertain the correspondence between such I.Q.'s and school grade.

Procedure: Scores were obtained in National Intelligence Test, Scale A, for 1,050 full blood Indians in U. S. Indian schools in Oklahoma and New Mexico. The approximate I.Q.'s of the subjects were obtained from the corresponding score and age. There were many scores so low that no definite I.Q. could be found, but this did not hinder finding the median score.

A correlation was sought between the actual I.Q.'s and school grade.

Results: For the approximate I.Q. as thus obtained for full blood Indians the median is 67.7; Q. 10.8. While the median approximate I.Q. increases with school grade even up into the ninth grade when the tests were tried, the correlation between the I.Q. and school grade, eliminating those for whom no I.Q. could be found, is only +.24,

P.E. .021. This approximate I.Q. is very low, and though education has a slight effect on it, still it is felt that facts regarding social status and Indian temperament must be considered before we can feel sure it correctly indicates the Indian level of intelligence.

Comparisons of White and Negro Children in Certain Ingenuity and Speed Tests. JOSEPH PETERSON, George Peabody College.

Testing different races for mental ability is by no means a simple matter. Differences in attitude, such as in the readiness to work at one's utmost speed, are almost sure to exist. Even for psychology students "as fast as you can" means a different thing the first time a test is given from what it does the second time, after the subjects have been ranked on their scores in the first test. Speed attitudes, accuracy attitudes, perseverance attitudes, etc., are functions of many outer conditions as well as of heredity, and are hard to make constant in racial comparisons. Hence in our race studies we supplement group tests with certain ingenuity tests, affording constant stimulation of S by E and superior opportunities for the observation of S's work. The Rational Learning test, formerly described, has recently been used in a modified form so that a fore-exercise is given on a problem of three letters, then on one of four letters, and finally the real test based on five letters follows. Every S then knows exactly what is to be done when he comes to the problem. The Mental Maze problem, described in the *Journal of Experimental Psychology,* 1922, 5, 270 *ff.*, has been modified so that S, with a picture of a maze of seven *culs de sac* before him, chooses, from successive pairs called out to him, numbers which will take him to the goal without errors. He is also asked to explain what would happen in case of certain suggested wrong choices. When he understands well what is to be done, certain common names are substituted for the numbers. He must then in the real test, still with the maze having numbered parts before him, choose from pairs of successively presented names those that will take him to the goal. In a third test E transfers three discs of different sizes from one circle to another by moving only one at a time and never covering one with a larger one. A third circle is employed as a transfer station. S then works the problem both with three and with four discs. Finally, when the problem is clear, S is to solve it using five discs. Speed tests in color-naming and form-naming are also used. Tentative results are given.

Concerning the Influence of Education and Environment on the Religious Ideas and Beliefs of Children. W. T. SHEPHERD, Washington, D. C.

The purpose of this study has been to determine, as far as may be, the importance of education and special environment in molding the ideas and beliefs of children concerning the more important objects and conceptions of religion. The ages of the children herein studied were from eight to twelve years, inclusive; 148 children were studied. They were from families of different occupations—from those of physicians, lawyers, farmers, merchants, clerks, laborers, and teachers. The subjects were obtained chiefly at the Methodist and Christian Sunday schools and the public schools of the town of Waynesburg, Pennsylvania, and the surrounding country districts. A few of the subjects were from Washington, D. C. The parents of 85 of the children were church members; those of 23 were not. The church affiliations of 40 of the children were not stated. Six of the subjects were Catholics, two were Jews (reformed), while the others reporting church affiliations were of the different Protestant denominations, viz., Methodists, Presbyterians, Christians, etc.

The method employed in the study was that of the questionnaire, supplemented by cross-questioning. Each child was questioned separately and cross-questioned, so that the answers might be as definite as could be obtained. The examination was so conducted as to permit the child to react in a normal manner and to feel at ease.

The writer concludes that education and environment have been of great importance in the formation of religious ideas and beliefs of children.

WEDNESDAY, DECEMBER 31, 9:00 A.M.

CONFERENCE OF EXPERIMENTAL PSYCHOLOGISTS

WEDNESDAY, DECEMBER 31, 10:00 A.M.

PROGRAM B

CLINICAL PSYCHOLOGY

The Need of an Organismic Conception of the Insanities. TRIGANT BURROW.

Notwithstanding the great advance of scientific conceptions in our approach toward the problem of mental disharmonies, there is still a

certain reservation in our attitude toward these disturbances. Despite the widening of our scientific outlook toward such reactions, we still deny to these conditions a like place with other manifestations in our scientific estimate of them. So that these diseases have yet to receive their full due from the distinterested outlook of an accepted scientific method.

In dealing with objective disease entities, we have long recognized the need of regarding such disorders in their sociological aspect. Tuberculosis, for example, is considered a social menace because it is socially propagated. This is an objective circumstance and its acknowledgment in no way outrages our social sensibilities.

In dealing, however, with the social aspects of insanity, we are necessarily dealing with a subjective social mood in which we ourselves are direct participants. Everyone knows the insult to personal traditions that is occasioned by the attempt to challenge the personal mood of the individual. A scientific basis which would place a check upon our automatic and habitual social mood is likewise automatically met by a concerted rebuff on the part of the social elements or individuals whose traditions are thus questioned.

For this reason our customary scientific precepts have become confused in their application to the mental sphere, and our attitude toward the problems of our social consciousness has lacked the validity of method that characterizes our approach in fields of the objective sciences. There is required an encompassment of mental disharmonies such as takes account of correlations between the mental system regarded as a sociological whole and the mental system of the individual as a derivative of it. It is only such an inclusive formulation that will bring our conception of disorders of consciousness into a logical alignment with the problems of biology as they are envisaged elsewhere by the medical sciences.

Recent Progress in Clinical Psychology. EDGAR A. DOLL, Ohio State University.

The *field* of clinical psychology has been extended beyond the study of the less hopeful abnormal conditions of social, physical, and mental deviations (*e.g.*, delinquency, sensory handicap, feebleminded-ness) to the more remediable types and to superiority or talent (*e.g.*, verbal deficients, emotional disorders, giftedness, special talent). The *range* of clinical inquiry now covers more aspects of individuality than formerly, intellectual measurements now being more generally

supplemented by other aspects of behavior and "personality" inventories. The *methods* are becoming more systematic, precise, objective, and economical. There is a tendency to critically reëxamine the clinical syllabus in an effort to avoid prejudicial data or information not susceptible of fairly specific interpretation. Minimal and differential schedules of diagnostic examining are feasible and desirable. *Standards*, especially differential standards, are still generally inadequate except for certain intelligence and performance tests or test scales. Diagnostic norms in relation to terminology are in debate or flux, especially with reference to such items as racial and social norms, adult levels, and prognostic devices. *Statistical techniques* need further expansion and more critical evaluation. *Clinical educational diagnosis* is a promising offshoot of clinical psychological diagnosis and presents a separate group of problems. The *results* of clinical diagnosis are being used more seriously and more extensively. This demands professional skill and ethical responsibility approximating medical practice. The *therapeutic aspects* of clinical psychology are becoming increasingly important and better defined. A plea is made for applying clinical methods more adequately in other applied fields. The importance of clinical psychology with college students is emphasized with special reference to results obtained at Ohio State University.

Clinical Psychology—Its Origin and Future. LIGHTNER WITMER, University of Pennsylvania.

I. The historic precursors of the clinical method in psychology, beginning with the veridical autobiography and biography, the clinical sketch in imaginative literature.

II. The scientific antecedents in physiology and psychology.

III. The foundation of the Psychological Clinic and the development of clinical procedure in psychological diagnosis; and

IV. The probable outcome of clinical work in providing a new orientation in psychology and education.

Monthly Increments of Development in Infancy. ARNOLD GESELL, Yale University.

Behavior is a functional index of development. Measurements and gradations of behavior items, therefore, furnish a clue to developmental status in infancy. The concepts of proportionate and of uniform development contrasted. The probable validity of the concept

of proportionate development. The rapidity of development in the first year of life compared with subsequent years. A preliminary report of a survey of ascending monthly developmental levels, based on a series of comparisons between one-, two-, three-, four-, five-, six-, etc., months-old infants. Increments of development observed. Some difficulties encountered and questions raised. The problem of individual differences in infancy. The relations between maturity and capacity. The value of monthly norms of behavior in infancy.

An Experimental Study of the Nursery School Child. HELEN T. WOOLLEY, Detroit, Mich.

Two methods which furnish a basis of comparison between children with nursery school experience and those without it have been used. The first consists of tests and retests by means of the Stanford revision of the Binet scale, and the other of a single testing by the Detroit kindergarten test used as an individual test.

The nursery school children were those in the Merrill-Palmer Nursery School who were in attendance long enough for retesting at intervals of from eight months to a year. As a control group, we used the children on the waiting list of the school who could not be accepted for lack of space. There is no basis of selection of the children in the school which would operate to make those in the school different in type from those on the waiting list. Order of registration, age, and sex are the points considered in selecting new children from the list. So far as we can see, both the children in the school and those on the waiting list constitute a fair cross-section of the community, except for the fact that the poorest and most ignorant elements are not represented. They are children from average homes.

Retests with the Stanford revision show a very significant increase of intelligence quotient between a first test, taken soon after entrance, and a second test taken from eight months to a year later. For half of the group the increase was so large that it averaged twenty points; there were very few cases of decrease. The same regime, carried out with children on the waiting list, showed variations on a second test, but no tendency to increase in quotient on the part of the group as a whole.

The comparison by means of the Detroit kindergarten test was made in the course of a standardization of the test for the years under five. Both children in the school and those on the waiting list

were used. The children in the school tested significantly higher than those on the waiting list.

We believe the difference to be due to the superior environment furnished by the nursery school.

The Sex Incidence of Feeblemindedness. CLARA SCHMITT, Bureau of Child Study, Chicago, Ill.

The proportion of feeblemindedness between the sexes reported in surveys which take note of this fact varies considerably.

The survey by the English Royal Commission reported by Tredgold gives a proportion of males to females of 6 to 5.

Surveys made among American school children show a proportion of mentally defective boys to girls varying from 1.5 to 1 up to 2 to 1.

The Bureau of Child Study of the Board of Education of Chicago examined 5,826 children referred by the schools as retarded or problem children during the year 1923–24. Of this total 3,287 were boys and 1,539 were girls. A count of intelligence quotients shows that 1,343 boys scored I.Q.'s of 75 or less to the lowest measureable limit, and 680 girls similarly, or a proportion of 1.95 to 1.

For the two years previous to 1923–24 a total of 9,648 retarded and problem children were examined. Of these, 6,517 were boys and 3,131 girls. The proportion of mentally defective boys to girls was as 2 to 1.

This uneven distribution gives rise to certain biological questions concerning the origin and inheritance of feeblemindedness and to social questions concerning practical care.

The Scaphoid Scapula and Mental Deficiency. J. E. W. WALLIN, Miami University.

Three types of vertebral scapular borders have been found in ancient and modern races, and in other primates and in other animals: the convex, the straight, and the concave. The term scaphoid (Graves) is applied to the latter two types. The forms are congenital and never change through life.

The most significant fact thus far revealed regarding the scaphoid scapula is that the incidence diminishes from the early decenniums to the late decenniums of life (Graves, Koellert, Reye). The conclusion has been reached that the newborn with convex scapulae has a decidedly greater chance of longevity, and that the scaphoid form is evidence of congenital constitutional inferiority, " one manifestation of a

blight affecting the whole organism," which abounds in persons displaying inborn weaknesses, asymmetries, deviations, structural and functional maladaptations, heightened susceptibility to disease, epilepsy, and mental deficiency.

Even the most reliable of the data culled from several thousands of the speaker's clinic cases failed to reveal any significant relation between the scaphoid form and descending intelligence categories and descending I.Q. groups. Our results are merely tentative, and suggest the need of repeating the investigation under more satisfactory conditions of control.

WEDNESDAY, DECEMBER 31, 2:00 P.M.

PROGRAM A

MENTAL MEASUREMENT

Intelligence: Definitions and Neural Markings of "Kinds," "Types," "Levels." JOS. U. YARBROUGH, Southern Methodist University.

Although we have come to a clearer understanding of the nature of intelligence in recent years, there is much work yet to be done before the topic is free of confusion. It is not the purpose of this brief paper to enter into a discussion of the many problems connected with this concept. Specifically, the writer hopes (1) to present a definite meaning for the terms "kind," "type," and "level," when applied to intelligence; and (2) to raise the question as to what the native neural conditions are which make these different kinds, types, and levels possible.

Just as there are kinds of men there are kinds of intelligence. Three are observed, viz.: (1) Tropic intelligence, (2) instinctive intelligence, and (3) reflective intelligence. In each kind both types and levels are found. Comparison of types or levels of one kind with that of another kind of intelligence invariably results in confusion.

Finally, an attempt is made to describe the neural markings which give us the different "kinds," "levels," and "types" of intelligence. The following suggestions are offered as probable factors in producing intelligence:

(1) The relative number of latent neural paths which with maturity can be opened up for new connections. The greater the number of these paths, the more intelligent the organism is capable of becoming.

(2) The ease with which these latent paths may be opened. One nervous system may be thought of as offering more resistance than another.

(3) The quality of the nerve fibers themselves, together with the synaptic connections. Where the nerve fibers are of the best quality, and the synaptic connections are smooth and firm, we have a sensitive piece of apparatus which is capable of detecting the slightest environmental changes and of responding to them effectively.

These are the neural markings of the intelligent person.

The Nature of Intelligence. R. M. OGDEN, Cornell University.

After commenting briefly upon the definitions of intelligence offered by the contributors to a symposium on the subject, published three years ago in the *Journal of Educational Psychology,* the more recently published views of Professor Spearman are criticized. An attempt is then made to suggest a way in which intelligence may be defined in scientific terms. Regarding any datum of observation as the emergence of an articulate figure from an inarticulate ground, intelligence characterizes the response to such a figure by the way in which the figure is defined. In its simplest form the definition of a figure of experienced behavior is given in terms of the figure's *contour:* the sharpness, clearness, and definiteness of its outline. A figure thus defined cannot be analyzed; but its conditions can be studied and controlled. An apprehended unit is from the start an organized whole, although it may be capable of further organization by a further definition of its contour and internal articulation.

If the nature of intelligence is revealed by the contour of experience, we must study the configurations of apprehension and response, in order to be able to determine their norms of completeness under various conditions of maturation and special training.

It is suggested that tests analagous to the " detour-board " experiment employed by Köhler with apes are more appropriate to an understanding of these figures and their definition than a " battery " of tests which allows no insight into the precise contours defined by the subject in the attainment of his test score.

Comparative Results of Tests of Ideational Processes and General Intelligence. JAMES P. PORTER, Ohio University.

The Yerkes Multiple Choice apparatus has been used as the test of ideational processes, the Otis Self-Administering and Miller Men-

tal Ability tests as measures of general intelligence with college and high school subjects, respectively.

The Yerkes apparatus and method present to the subject problems in terms of groups of piano-like keys varying in number and location from a row of twelve, a certain key, the first on the left, being always the one which will make a little light flash out. Other relations used were second from the right, alternately the first on the left and the first on the right, and the middle key. The total number of groups presented in order for the subject to announce the relations used in all four problems constitutes the score.

The correlation by the Product-Moment method will actually be negative, but must be interpreted positive, since the fewer the key settings the more rapid the functioning of the idea of the relation. With groups of college students, nine, twenty-five, and forty-three in number, the correlations are .459 $\pm$.17, .249 $\pm$.12, .329 Otis A, .366 Otis B. The two forms of Otis give correlation .883 with each other. The Multiple Choice scores and Miller Mental Ability scores with nineteen high school boys and girls correlate .537 $\pm$.044. This group is probably less highly selected than any of the other groups. Our Multiple Choice findings with individuals indicate that such traits as self-confidence, nervous instability, and peculiar mental attitudes can be more correctly analyzed. It is a promising performance and objective test requiring in time only fifteen to forty-five minutes. There is at least a moderately significant positive correlation between ideational processes (ability to solve concrete objective problems involving ideas and relations) and general intelligence as tested by the two group tests used. There is some reason for believing that the higher ideational relational processes are particularly tested. Inasmuch as some (Professor Colvin, for example) argue that the usual group intelligence test calls into function only the simpler mental processes, and this only in the linguistic paper-and-pencil form of exercise, the Multiple Choice offers interesting possibilities. A modified form of this apparatus was used in demonstration as the paper was read.

Is a Superior Adult Test Practicable? A. A. Roback, Harvard University.

Although there is no dearth of mental tests on the market, and in spite of the fact that many of them have been of valuable service, there is a deplorable lack in one direction, viz., in testing superior

adults and the higher functions. By a superior adult I mean one who is capable of completing a full academic course in a first-class college without difficulty. A higher function, as differentiated from a lower function, is one which synthesizes a situation, and does not merely bring about a response to a stimulus.

Many causes have worked against the standardization of such a test or rather series of tests: (1) The presupposition that intelligence ceases to grow at a pre-adult age; (2) the specialized interests of adults, something which renders uniformity almost beyond reach; (3) the fact that the more complex the situation prescribed, the more variable are the responses, because of the use of different methods, in keeping with one's individual make-up and experiences; (4) the practical impossibility of gaining a uniform standard in scoring and indeed in finding both intelligent and conscientious workers; (5) the disproportionate interest taken in children as compared with adults, except in industrial and vocational connections. In other words, the subject of mental tests has been wholly dominated by the demands of applied psychology, thus blocking the theoretical approach.

It was in accord with these circumstances that the numerous objective tests have sprung up, their chief advantages being neatness in presentation, uniformity in scoring, and the saving of time and labor on the part of both examiners and examinees. These advantages, however, are not sufficient to compensate for the few but great disadvantages involved in these tests, viz., of (1) only touching on the outskirts of the objective; (2) not allowing for individual differences; (3) imposing an artificial situation which favors more the superficial individual than the thinker; (4) eliminating from scrutiny *ab initio* the finer mental qualities, such as acumen, judgment, interpretation, and reasoning (outside of the mechanical or mathematical sort); (5) the laying of undue emphasis on speed as compared with carefulness.

This paper does not advocate the rejection of the objective or multiple choice tests, but rather is intended as a plea for the trying out and devising of tests to tap the intelligence of superior adults in nonspecialized fields, yet in a way which does not require these adults to adjust themselves to the universe of a child. Such tests, in spite of the almost insuperable drawbacks in the matter of standardization, would, if properly revised after adequate experimentation, not only conduce to a better understanding of individual differences, but would result in a deeper insight into the notion of general intelligence.

The Will-Temperament of College Disparity Students. J. B. MINER, University of Kentucky.

An intensive study was reported on tested personality traits of two groups of sixteen students each showing extreme disparity between their Alpha scores, measured in sigma of a group of 456 freshmen, and their scholarship scores, measured in sigma for the same large group. One group was extreme in the direction of scholarship lower, the other in the direction of scholarship higher. No case was used in these extreme groups which did not show at least a disparity of one sigma and which had not had its tested intelligence confirmed by one other intelligence test and maintained this disparity for both the first and second semester's scholarship. The Downey Will-Temperament test was given these extreme disparity cases.

A method was developed for empirically utilizing a series of separate tests so as quickly to determine combined borderlines which would pick out a group of cases to be distinguished for a practical purpose. This method of *Serial Combination of Borderlines* supplements that suggested by Bills for combinations of two tests. By its use, for example, all the thirty-two cases were separated into the opposite types of disparity by the favorable combination of a score below eight in Speed of Decision and below seven in Motor Inhibition, or, if outside of this combination, then below seven in Resistance to Opposition or above three in Volitional Perseveration. The error of such a prediction can be empirically determined when records are available for larger groups. The same criteria separated eighteen additional extreme disparity cases which did not continue their disparity of one sigma the second semester. This is the form of statement which should be expected when a variety of personality traits are used for predicting success in a specific situation. No combination of two of the Downey tests separated more than twenty-five of the thirty-two cases.

For 456 freshmen there was no relationship between the tendency to disparity and the individual variability of students from test to test in the Alpha series. The correlation for the first semester discrepancies with individual variabilities was —.05; for the second semester, —.02. Variability from test to test in a series of intelligence tests is thus not an indication of variation between tested intelligence and scholarship.

A Discussion of the Quotient Method of Specifying Test Results. GERTRUDE RAND, Bryn Mawr College.

The quotient method of specifying test results has been under discussion since the Intelligence Quotient was made an integral part of the Stanford-Binet scale. The experimental evidence that had been advanced in support of its value has been based largely on data obtained from retests. In the past few years the application of the method has been extended to other intelligence tests, to educational tests, and most recently to furnish an index of achievement. In every case the procedure has been merely to assign the value of 100 to the median performance at each age with very little if any attempt to show that values above and below 100 are numerically equivalent for any one test at different age levels, or from test to test at the same or different age levels.

The present discussion covers the following points: (1) The theoretical implications of the quotient method are restated. (2) Data are presented which show for comparison the variability of the quotient at different age levels for scales scored in Mental Age and for scales scored in points. (3) For one test a comparison is made of the variability of the quotient from age to age when the same data are scored in points and when they are transmuted into Mental Age. The approximate uniformity of the variability of quotient from year to year when the data are expressed in Mental Age is in striking contrast to the lack of uniformity when expressed in points. (4) Factors are listed intrinsic and extrinsic to the test which may cause a fluctuation of the Stanford-Binet I.Q. on retest. Emphasis is laid (a) on the individual variation in the age of mental arrest and the difficulty in making due allowance for this factor, and (b) on the effect of the absolute magnitude of chronological age on the constancy of the I.Q. (5) The Achievement Quotient is questioned because it assumes that there is the same numerical relationship between the points on the scale of Educational Quotients as on the scale of Intelligence Quotients. Not only has this relationship not been demonstrated, but there is evidence that the E.Q. unit is smaller than the I.Q. unit. To this may be due in part at least the conclusion that bright children tend to have low and dull children high A.Q.'s.

An Objective Humor Test for Children. GRACE E. BIRD, Rhode Island College of Education.

This test consists of twenty pictures of absurd situations easily comprehended by normal children of the elementary school. The

pictures represent an ascending scale of difficulty ranging from approximately zero humor, through obvious absurdity, all the way to situations requiring a considerable degree of interpretation.

The pictures are arranged by twos. The child tested is asked to put a mark on the funnier of each pair, making ten choices in all. The time consumed in administering the test is less than ten minutes. The time necessary for scoring each child's work is less than one minute. The score value attached to each correct choice in each pair of pictures is determined by the number of individuals in that grade who selected that picture as the more amusing of the two. The norm for each school grade is the median score attained by that grade. These norms are based upon the decisions of 500 children ranging in chronological age from three to sixteen, in each school grade from the kindergarten to grade eight.

Throughout the elementary school a general agreement prevailed, with sufficient variation to justify the assignment of different score values for the achievement of the various grades. The favorite pictures among the children tested represented unusual antics of persons or animals, discomfiture of an individual, and some form of contest or pursuit. Conspicuous differences of opinion occurred where an element of pathos was combined with absurdity, also where the situation was not very closely related to the ordinary experience of children.

A correlation of .89 was obtained between success in the test and I.Q.'s. Children whose standard of humor varied widely from the norm of their school grade were found also to be socially out of adjustment with their school playmates, either because they were disliked for lack of coöperation, shunned because of unusual behavior or shyness, or because they were disregarded for no obvious reason. Common observation indicates that even among adults wide divergence in an appreciation of the ridiculous is an element of misunderstanding.

The aim of the test is to determine objectively to what extent a child's "sense of humor" deviates from the norm of his associates, with a view to discovering the underlying reason, thereby making one more contribution to the various methods of diagnosis.

WEDNESDAY, DECEMBER 31, 2:00 P.M.

CONFERENCE OF EXPERIMENTAL PSYCHOLOGISTS

BOOKS RECEIVED

EARL OF DUNRAVEN, *Experiences in Spiritualism with D. D. Home.* (Introduction by Sir Oliver Lodge.) Glasgow: Maclehose, 1924. Pp. 285.

ELIASBERG, WLADIMIR, *Grundriss einer allgemeinen Arbeitspathologie.* Leipzig: Barth, 1924. Pp. 41.

BERTRAND-BARRAUD, DANIEL, *Les Valeurs Affectives et l'Exercice Discursif de la Pensée.* Paris: Vrin, 1924, Pp. xvii+306.

LEQUIER, JULES, *La Recherche d'une Première Vérité.* (Collected by C. Renouvier with biographical notice by L. Dugas.) Paris: Colin, 1924. Pp. 424.

VON KRIES, JOHANNES, *Goethe als Psycholog.* Tübingen: Mohr, 1924. Pp. 52.

CONDILLAC, Essai sur l'Origine des Connaissances Humaines. (Biographical and bibliographical notices by R. Lenoir.) Paris: Colin, 1924. Pp. x+225.

TANNENBAUM, SAMUEL A., *The Psychology of Accidents and "Symptomatic Actions."* New York: Tenny, 1924. Pp. 92.

LHOTZKY, HEINRICH, *The Soul of Your Child.* New York: Dodd, Mead, 1924. Pp. 165.

NORTHRIDGE, W. L., *Modern Theories of the Unconscious.* New York: Dutton, 1924. Pp. xv+194.

MCDOUGALL, WILLIAM, *Outline of Psychology.* New York: Scribner's, 1924. Pp. xvi+456.

WITTELS, FRITZ, *Sigmund Freud, His Personality, His Teaching, and His School.* (Trans. by E. & C. Paul.) New York: Dodd, Mead, 1924. Pp. 287.

AHLENSTIEL, HEINZ, *Ueber die Stellung der Psychologie im Stammbaum der Wissenschaften und die Dimension ihrer Grundbegriffe.* Heft 23 Abhandlungen aus der Neurologie, Psychiatrie, Psychologie und ihren Grenzgebieten. Berlin: Karger, 1923. Pp. 56.

PYLE, WILLIAM H., *Psychological Principles Applied to Teaching.* Baltimore: Warwick & York, 1924. Pp. vi+197.

MYERS, CHARLES S. (Editor), *Seventh International Congress of Psychology. Proceedings and Papers.* Cambridge: Univ. Press, 1924. Pp. xxv+388.

PRUETTE, LORINE, *Women and Leisure. A Study of Social Waste.* New York: Dutton, 1924. Pp. xxiv+225.

NOTES AND NEWS

Dr. Homer G. Bishop, formerly instructor in Cornell University, has become assistant professor in the Department of Psychology at Smith College. Miss Ruth Spence, from the Graduate School of Columbia University, has become instructor in the same department. The department has moved this autumn into new quarters of twenty-one rooms. These are in a building formerly occupied by the Music Department of the college, and now renamed Pierce Hall in memory of Arthur Henry Pierce, professor of psychology at Smith College from 1900 to 1914 and Secretary of the American Psychological Association for the years 1908, 1909 and 1910.

Professor Edmund C. Sanford, of Clark University, died suddenly on November 23 in Boston while enroute from Worcester to Wellesley to attend a meeting of the psychologists in and about Boston.

Dr. Raymond O. Fitler, assistant professor of psychology at the University of Minnesota, and Dr. Homer B. Reed, professor of psychology and education at Grinnell College, have each been appointed to an assistant professorship of psychology at the University of Pittsburgh.

Harold A. Larrabee, who has just returned from a year of study in Europe on a fellowship from Harvard University, has been appointed assistant professor of psychology in the University of Vermont.

Fuh Tan University, Kiangwan (Shanghai), China, has been given $100,000 for a psychology building. Dr. Zing Yang Kuo, who was trained in psychology at Columbia University and at the University of California, is head of the department of psychology.

W. V. Bingham, for nine years professor of psychology at Carnegie Institute of Technology, has been made the Director of the Personnel Research Federation with headquarters in the Engineering Societies Building at 29 West Thirty-ninth street, New York City.

Professor Kurt Koffka, of the University of Giessen, will give two courses during the first term of the summer quarter of the University of Chicago. His courses will deal with various aspects of the Gestalt Psychology. In one course he will emphasize the experimental treatment of this topic, in the second, the genetic treatment.

Vol. 22, No. 3 March, 1925

THE PSYCHOLOGICAL BULLETIN

1. GENERAL

186. Norris, O. O., The X and Y of Psychology I. *J. of Philos.*, 1923, 20, 533–44.

There are two questions which constitute the X and the Y of psychology and these are: (1) In the physicist's world of measurable content and behavior may there also be room for quality? (2) If there be quality how is it to be conceived and how related to quantity? Now physics is not nature but "Man is the measure of all things," yet for man to measure does not destroy nor really alter nature. Objective nature merely becomes a stimulus to a psychic experience. What we measure is physical and what we experience is psychical, but we shall never be able to refine the two series, the quantitative and qualitative, or physical and psychical until they coincide, though they exist separately. There are two kinds of natural status, *i.e.*, existential and occurrential and all realities may be referred to these, both qualitative and quantitative realities. They are merely two kinds of character, discrete in identity, not independent of a common occurrence and not wholly incommensurable, but they may not be translated either in terms of the other. What we need is a conception of mind that will permit of being regarded objectively as we consider other natural realities, both existential and occurrential. In consequence not physicalism, behaviorism, nor psychism and introspectionism can be all there is to psychology. In short we need a conception of the psychical in its relation to the physical which will be objective. The two phases we call the X and Y of psychology. The qualia of conscious experience, we consider, as neither physical nor psychical. Our psy-

chics have not attained to a science. Our psychology is a conglomerate of physics and a mystical psychics and the nearest approach to a scientific psychics is psychophysics as found in the Weber-Fechner Law. Externally and internally occurring qualia are homologous in character. The natural datum of which the psychical is an aspect is assumed to be an occurrence. It is of the nature of a clash or impact between two masses. The qualia and the quanta of impacts are not different but two characters of the impacts. The former are as mechanistically determined as are quanta. Under the circumstances there ought to be a logarithmic correspondence of qualitative intensity for the quantitative intensity and we find this on the psychophysical relationship. The psychical waits for its occurrence upon the behavior of masses. It will be dependent upon physics for its data. As a science psychics must consist in identifying qualia of experience by indicating the kinds of masses and velocities producing the impacts. This does not mean that psychics will become a branch of physics. T. R. GARTH (Denver).

187. CONKLIN, E. S., The Scale of Values Method for Studies in Genetic Psychology. *U. of Oregon Publications,* II, No. 1, 1923, 2, No. 1, 36 pp.

Conklin has attempted to remedy many of the defects of the questionnaire method of collecting data upon character traits by combining it with the order of merit or ranking method in what he calls the "scale of values" method. The questionnaire feature which has been retained consists in the sending of prepared sheets of matter to various persons who are to read the instructions and, acting upon them, to fill in the printed blanks, not with words, but with a numeral from the numerals referring to degrees or scales of judgment printed before them. The numerals, in the first series of tests ranging from 1 through 13, refer to six degrees of pleasure, indifference, and six degrees of displeasure (and a similar arrangement was worked out for belief and disbelief). Hence, this choosing of a numeral, indicating one's degree of pleasure or displeasure aroused by a given (printed) statement or remembered as having characterized one's former experience with reference to the act suggested by the printed statement, or one's choosing of a numeral indicative of one's degree of belief or lack of belief in a given statement, is really the order of merit or ranking method of expressing judgments. Ostensibly the work has been carried through also

in the interests of character and temperament tests, so sadly neglected in the earlier mental testing and dealing with a topic which not even experimental psychology has met with glowing success. The paper contains 16 graphs, 17 short tables, a bibliography of 18 references, and a specimen of the printed blank. Some of the more outstanding results which came to light, in the total of 13,600 belief judgments and 10,194 pleasure judgments from 1,700 persons ranging in age from thirteen years to twenty-six years, were the following: Repetition of the test after six weeks reveals a high degree of constancy of results. The scale of values method gives results which have a high degree of correlation with those obtained by a typical questionnaire method. The scale of values method gives data which can be handled statistically better than the data obtained by the questionnaire method. The former method gives results identical with those obtained by the right-wrong questionary method, while at the same time allowing for greater varieties in the degree of pleasure or displeasure experienced by the observer. Sex differences in emotional attitude, and age differences, are revealed by the data obtained with the use of the scale. A 5-term or a 9-term scale, of degrees of pleasure-displeasure or of belief-disbelief, was found to be more effective than or just as effective as a 13-term scale, inasmuch as the observer finds at least four of the degrees superfluous or else too abstract for his discrimination, or finds his emotional attitude judgments running in stereotyped intensity values which do not correspond with the verbally and finely distinguished degrees presented by the longer scale. H. R. Crosland (Oregon).

188. Binswanger, L., Über Phänomenologie. *Z. f. d. ges. Neurol. u. Psychol.*, **82**, 10–45.

Es handelt sich um ein einführendes, kritisches Referat, welches B. auf der 63. Versammlung des schweizerischen Vereins für Psychiatrie im November 22 in Zürich vortrug. Er geht von der naturwissenschaftlich eingestellten Psychologie aus und zeigt zunächst am Verhalten des Künstlers den Gegensatz von sinnlicher, wahrnehmungsmässiger Kenntnisnahme anschaulicher Gegebenheiten einerseits, und intuitiver, "schauender" Betrachtung andrerseits. Er entwickelt, dann die entsprechenden Anschauungen Husserls im engen Anschluss an den 2. Band der *"Logischen Untersuchungen"* und zeigt, dass es für jede Gegenbenheit, besonders aber für die Gegenstände psychologischer Forschung eine derartige, einfühlende,

auf das "Wesen" gerichtete, schauende Kenntnisnahme gibt. Ein weiterer Abschnitt ist der phänomenologischen *Methode* gewidmet, wo an dem Beispiel der Wahrnehmung der Unterschied von naturwissenschaftlich-psychologischer und kategorialer Wesensschau im Sinne Husserls durchgeführt wird. Schliesslich zeigt B. die Art, wie die phänomenologische Methode am psychopathologischen Objekt anzuwenden ist, indem er skizzenhaft ein Programm zur phänomenologischen Erforschung des *Autismus* entwirft. Die Arbeit zeichnet sich sowohl durch die gedankliche Durcharbeitung und Beherrschung des Stoffes, als auch durch die klare und eindringliche Herausarbeitung der Probleme aus. W. Mayer-Gross (Heidelberg).

189. Gertz, E., Untersuchung über das Chronoskop Hipps. *Skand. Arch. f. Physiol.*, 1923, **44**, 103–118.

Der gewöhnliche Fallhammer gibt keine absolute Zuverlässigkeit, sondern vermag nur den Gang der Uhr während einer längeren Versuchsreihe zu kontrollieren. Der Verf. greift daher auf die älteren Kontrollmethoden zurück, welche auf dem freien Fall einer Kugel beruhen. Eine Verbesserung der Fallvorrichtung und eine Verfeinerung der Berechnungsart, die namentlich auf den Luftwiderstand Rücksicht nimmt, führt zu einer sehr exakten, absoluten Kontrolle der Uhr. O. Klemm (Leipzig).

190. Thomson, G., Critical Notice of "Naive Physik" von Otto Lipmann und Hellmuth Bogen. *Brit. J. of Psychol.*, 1924, **14**, 415–419. J. E. Anderson (Yale).

191. Williams, T. A., Prevalent Misunderstandings Concerning Unconscious Mind. *J. of Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 77–84.

The prevalent notion that emotion can affect one from unconscious or subconscious levels is quite misleading. It is true that the underlying motivation for behavior is often unknown to the individual, but this is due not to his innate inability to ferret it out, to wrest it from the clutches of the unconscious, but to failure to turn attention in its direction. Honest, introspectional search through the unconscious for an emotional fact is as fruitful as attentive search through subliminal regions for a forgotten intellectual fact. ". . . This avoidance in the mind need postulate no mystical theory of uncon-

scious; for the attempt to avoid by diversion, distraction, self-deception, substitution, is a perfectly straightforward way without recourse to artefactual conceptions of the unconscious." ". . . Unwillingness to face should not . . . be translated into incapacity to know." M. S. CHILD (Boston Psychopathic Hospital).

2. NERVOUS SYSTEM

192. BERRY, R. J. A., Brain and Mind. *Brit. Med. J.*, 1924, **3303**, 707–710.

Man has ". . . not fewer than three times as many cortical neurones as any other animal; hence a study of brain structure is an essential first step in the study of the mind and its aberrations." D. A. LAIRD (Colgate).

193. COURTNEY, J. W., The Hygiene of the Nervous System. *Boston Med. and Surg. J.*, 1924, 190, 497–503, 589–591.

Lectures given to Wellesley students dealing with heredity, sex immorality, alcohol, adolescence, and complexes. D. A. LAIRD (Colgate).

194. HERRICK, C. J., Origin and Evolution of the Cerebellum. *Arch. Neurol. and Psychiat.*, 1924, 11, 621–652.

A survey of the development of the cerebellum, largely from the standpoint of comparative anatomy, from the amphibian forms through fishes, reptiles and birds, and in mammals, with a consideration of its functions. These functions the author takes to be, broadly considered, coördinative rather than correlative; that is, "the cerebellum does not appear to participate in the analysis of sensory impressions for determining what the appropriate response shall be; but after the character of the response has been established, unconsciously in lower centers or consciously in the cerebral cortex, the cerebellum participates in the execution of the movements. Its own activities are wholly unconscious." B. M. CASTNER (Boston Psychopathic Hospital).

195. NICHOLSON, F. M., Morphologic Changes in Nerve Cells Following Injury to Their Axones. *Arch. Neurol. and Psychiat.*, 1924, 11, 680–697.

When their axons are injured, the structural changes taking place in nerve cells occur in a somewhat definite manner, though

differently under the two different modes of injury, ligation and tearing. After a mild injury, such as ligation, degenerative changes involving all the cellular constituents except the nucleolus begin within twenty-four hours, reaching their maximum between the ninth and fifteenth days after injury. Beginning with the sixteenth day, regeneration takes place gradually until the forty-fourth day after sustained injury, when the cell has completely recovered in every respect. The changes include swelling, followed by shrinkage, of the cytoplasm; depletion and subsequent replacement of the chromophilic substance, in each case from the nucleus peripherally; and, within the nucleus itself, successively, decrease, increase, decrease again, and finally return to normal amount of the chromatin material. Other features of the nuclear reaction are inability of staining reaction of the nuclear wall, and distortion of the entire nucleus. Following the other type of axon injury, tearing, the degenerative changes are slightly more accentuated, and the stages are longer. The nuclear degeneration occurs later than that of the cytoplasm, whereas the two are coincident in the ligation procedure. B. M. Castner (Boston Psychopathic Hospital).

196. Schaffer, K., Zum Problem der Hirnforschung. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 452–465.

Schaffer hat die Behauptung aufgestellt (*Z. f. d. ges. Neurol. u. Psychiat.*, Bd. 38), dass die Furchenbildung in der Grosshirnrinde den primären Vorgang darstellt (Furchenbildung schon im 5. Foetalmonat, Bildung der Rindenschichten erst vom 6. Monat an) und als aktiver "Randschleiervorgang" aufzufassen ist, der von der Differenzierung der embryonalen Rindenplatte *ganz unabhängig* ist. Die Bildung der Windungen saher als passive Erscheinung an. In der jetzt vorliegenden Arbeit wendet er sich gegen Einwände, die von Landau und Bielschowsky namentlich mit Bezug auf histologische Einzelfragen erhoben worden sind. An dieser Stelle interessiert nur, dass Verf. jetzt seine früher an Wundt angelehnte Annahme einer *Oberflächenspannung* als Ursache der Furchenbildung und damit eine mechanische Erklärung aufgibt und nur noch den "histologischen und biologischen" Faktor gelten lässt. Th. Ziehen (Halle a/S.).

198. Mingazzini, G., Pathologie des Kleinhirns. *Deutsche Z. f. Nervenheilk.*, 1924, **81**, 8–58.

Aus dem sehr übersichtlichen und gründlichen Bericht *Marburgs* sei als unmittelbar interessant für die Psychologie nur der zusammenfassende Schlusssatz hervorgehoben: Das Kleinhirn ist ein Organ, das propriozeptive und labyrinthäre Reize auf direktem Weg durch das Rückenmark und auf indirektem über das Striatum und den Cortex modifiziert erhält und mittels dieser Jmpulse synergische Bewegungskombinationen reguliert und zwar anfänglich nur die lebenswichtigen der Statik und Lokomotion, später aber auch solche, die mit den genannten Mechanismen nicht mehr in direktem Zusammenhang stehen. *Mingazzini* kommt zu dem Ergebnis, dass wenigstens bei dem Menschen in der Kleinhirnrinde *keine* gemäss den Körpersegmenten gegliederte Lokalisation besteht; zurzeit könne man nur zwei Regionen unterscheiden: eine mehr mediale im Vermis superior (Palaeocerebellum) und im Lobus quadratus anterior für die Statik und Lokomotion und eine mehr laterale im grössten Teil der Kleinhirnhemisphären (Neocerebellum) für die einseitigen Richtungsbewegungen der oberen Extremitäten. Diese motorische Funktion ist dem Einfluss der propriozeptiven Reize subordiniert, die von der Körperperipherie, vom Labyrinth und den bedeutendsten (fronto-temporo-okzipitalen) Regionen des Grosshirns herkommen. Das Kleinhirn funktioniert sowohl als "Kraftakkumulator" (Lewy) wie auch als "Bewegungssynergieregulator." Th. Ziehen (Halle a/S.).

199. Berger, H., Zur Jnnervation der Pia mater und der Gehirngefässe. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 216–220.

Für die physiologische Psychologie ist die Festellung wichtig, dass die Gefässe des Gehirns nur, *soweit sie in der Pia verlaufen,* mit Nerven versehen sind, und die Gefässe *innerhalb der Hirnsubstanz selbst* frei von Vasomotoren sind. Th. Ziehen (Halle a/S.).

200. Schilder, P., Über den Wirkungswert psychischer Erlebnisse und über die Vielheit der Quellgebiete der psychischen Energie. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 1–15.

Verf. meint, dass jedes psychische Erlebnis einen "Wirkungswert" habe, und dass diesem neben den "psychisch fassbaren" Komponenten somatische zukommen. Dieser Wirkungswert soll

" psychische Energie " sein, die an ein bestimmtes Erlebnis gebunden ist. Dem Wirkungswert entspricht im psychischen Jnnenleben die " Jntention," die den psychischen Wirkungswert spiegelt. Auf dem Gebiet des Denkens und Handelns erscheint der Wirkungswert im "Antrieb." Letzterer ist kortikal und subkortikal. " Die subkortikale Energie ist vielfach untergestaffelt, sie flottiert bis zu einem gewissen Grade frei, kann an kortikale Erlebnisse gebunden werden, und kortikale Energie kann in subkortikale transformiert werden." Der kortikale Antrieb setzt sich aus Energie motorischer und nichtmotorischer Art zusammen. Subkortikale Energien werden durch die kortikalen Umschaltungen dirigiert. Der Antrieb, der sich allerdings in sehr verschiedenen Bewusstseinshöhen abspielen kann, ist ein einheitliches psychisches Erlebnis. Die Gesetzmässigkeiten, die die Psychoanalyse auf psychischem Gebiet festgestellt hat, gelten auch für die Energieverschiebungen tieterer Stufen. Zwischen der Arbeitsweise jedes Einzelstaffels gibt es charakteristische Unterschiede. Die Hirnapparate sind " Sammler, Verteiler der psychischen Energien." Ebenso ist aber auch der " Komplex," das verdrängte Erlebnis " ein solcher Sammler und Verteiler." Th. Ziehen (Halle a/S.).

201. Vogt, O., Furchenbildung und architektonische Rindenfelderung. *J. f. Psychol. u. Neurol.*, 1923, **29**.

Im Anschluss an den *Wetzel*'schen Aufsatz uber die Beziehungen der Hirnwindungen zu den *Brodmann-Vogt*'schen Felder betont V., dass man Zwischen dem Wert der Furchen für eine architektonische Orientierung in der Hirnrinde und der Bedeutung der architektonischen Felder für die Entstehung der Furchen scharf unterscheiden muss. E. Wallenberg (Danzig).

202. Mussen, A. T., A cytoarchitectural atlas of the brain stem of the Macacus Rhesus. *J. f. Psychol. u. Neurol.*, 1923, **29**, 451.

M. hat ein Laboratorium von *Alzheimer* 19 Frontalschnitte und 14 Sagittalschnitte des Hirnstammes von Macacus Rhesus photographiert, bei 8 facher Vergrösserung inclusive Schrumpfung nach Fixation, und daraus einen Atlas zusammengestellt, der in erster Reihe als Führer dienen soll bei der Ausführung experimenteller Läsionen mittels *Clarke's* stereotaktischem Instrument, das bekanntlich zu dem Zweck konstruiert wurde möglichst kleine Zerstörungen an ganz bestimmten Orten innerhalb des Gehirns anzulegen. Die

3 dem Koordinatensystem entsprechenden Ausgangsebenen sind folgende: (1) horizontale Ebene 10 mm. höher als und parallel der horizontalen Basallinie (*Clarke*), die vom unteren Pol des vorderen knöchernen Orbitalrandes zum Mittelpunkt des Meatus auditorius externus geht; (2) frontale Ebene senkrecht zur 1. durch den Mittelpunkt des Meatus auditorius externus; (3) Sagittale Ebene in der Medianlinie. Jedes Photogramm enthält die Schnittlinien mit den anderen 2 Ebenen und die Entfernung des Schnittes von der dritten. Durch eingeschriebene Zahlen, deren Bedeutung eine Tabelle erläutert, kann der Laesionsort leicht kontrolliert werden. E. WALLENBERG (Danzig).

203. WETZEL, G., Hirnwindungen und *Brodmann-Vogt*'sche Felder in ihren gesetzmässigen Beziehungen. *J. f. Psychol. u. Neurol.*, 1923, 29, 434.

W. gibt eine kritische Zusammenstellung von den Anschauungen über das Verhältnis der Furchen und Windungen in der Grosshirnrinde zu den *cytoarchitektonischen* bzw. *myeloarchitektonischen* Rindenfeldern. Er kommt dabei zu dem Schlusse, dass es "lokal verschiedene, schon von Anfang der Entwicklung des Grosshirns an determinierte Bezirke sind, von deren besonderembiologischen Verhalten im Wachstum und Differenzierung die Windungen und Furchen abhängen. Die Lage und Differenzierung dieser Felder ist einer entwicklungsmechanischen Begründung nicht zugänglich, wohl aber ihre Beziehung zu den Furchen. Es besteht übrigens eine gewisse Parallele zwischen den nach dem Mosaiktypus (*Roux*) determiniert sich entwickelnden Eiern und der Differenzierung der Areae des Gehirns." Eine besondere Wichtigkeit besitzt die *Myeloarchitektonik* für die Vorwölbung der Windungen, ihre "Ausfüllung," die mit zu den mechanischen Bedingungen der Furchenbildung gehört, insbesondere die Associationsfasern. W. sieht mit *Brodmann* und *Vogt* die histologische Differenzierung der Areae und ihre Mannigfaltigkeit als Aequivalent der geistigen Entwicklungsstufen an. Einer reicheren Entwicklung der Areae beim Menschen gegenüber höheren Affen entspricht auch eine reichere Entwicklung der Windungen. Die Furchung der Gehirne geistig hochstehender Menschen steht damit im Einklang, die Windungen "haben mehr Bedeutung als nur die von topographischen Hinweisen." Der Ref. W. möchte dem gegenüber auf die lissencephalen kleiner Sänger ohne

Furchen und Windungen einerseits, die dem Menschenhirn bezüglich der Furchen—und Windungszahl weit überlegenen Gehirne von Phocaena und Elephas hinweisen. E. Wallenberg (Danzig).

204. Ramon y Cajal, S., Studien über den feineren Bau der regionalen Rinde bei den Nagetieren. *J. f. Psychol. u. Neurol.*, 1924, **30**.

Das Feld 29 (retrospleniale Rinde von Brodmann) des Kaninchens und der Maus ist ein "Fundamentaltypus," ein sechsschichtiger Typus. Und zwar unterscheidet Cajal folgende Schichten: (1) Plexiforme Schicht; (2) Schicht der sternförmigen Zellen; (3) Schicht der senkrechten spindelförmigen Körperchen; (4) Schicht des tiefen fibrillären Plexus; (5) Schicht der grossen Pyramiden; (6) Schicht der polymorphen Körperchen. Die besonderen Eigentümlichkeiten dieser Rinde liegen in folgenden Tatsachen: Schicht 1 ist ungeheuer stark entwickelt. Unter dieser Schicht liegt eine Zone von dicken, sternförmigen Zellen, morphologisch sowohl von den Pyramiden wie von den Brodmannschen "äusseren Körnern" unterschieden. Die Schicht 3 wird durch senkrechte spindelförmige Elemente gebildet. Unter dieser Schicht 3 liegt ein äusserst dichter Nervenplexus; zwischen den (exogenen) Fasern dieser Schicht liegen zahlreiche spindelförmige Körperchen. Functionell stellt diese Rindenregion wahrscheinlich eine tertiäre Geruchsstation dar; sie ist nämlich stark entwickelt bei Macrosmatikern; sie liegt in der Nähe des Focus spheno-occipitalis und des Ammonshornes; sie tritt phylogenetisch sehr früh auf; in Bau und Schichtung ähnelt sie Regionen, die sicher mit secundären oder tertiären. Bahnen in Beziehung stehen, die mit dem Geruchssinn irgend einen Zusammenhang haben. W. Riese (Frankfurt a/M.).

205. Dahlberg, C., Die quantitativen Bestimmungen zwischen der grauen und der weissen Substanz im menschlichen Grosshirne. *Anat. Anzeig.*, 1924, **57**, 49.

Eine sichere Bestimmung des Volumverhältnisses zwischen grauer und weisser Substanz ist nach des Verfassers Ansicht von Interesse für die Hirnphysiologie. Er hat eine eigene Methode ausgearbeitet und mit ihrer Hilfe 10 Hirne untersucht. Im untersuchten Material betrug das Volumen der grauen Substanz im Mittel 53.6 per centum des Grosshirnvolumens, die Kerne machen im Mittel 3.6 per centum aus. Wenn man nach dem Vorgang des Verfassers das Hirn einteilt

in einen pränucleären Abschnitt (bis zum oralen Beginn der Centralganglien), in ienen nucleären (der die Substanz der Centralganglien selbst in ihrer gesamten orocaudalen Ausdehnung umfasst) und einen postnucleären (vom ersten Schnitt an, auf dem eben nichts mehr von den Centralganglien zu sehen ist), so findet man: dass procentual am wenigsten graue Substanz im nucleären Abschnitt vorhanden ist. Im prä- und postnucleären Abschnitt findet sich beim Mann procentual etwa gleichviel graue Substanz. Bei Frauen hingegen findet man im pränucleären Teil (also dem Stirnlappen) weniger graue Substanz als im postnucleären und weniger als im entsprechenden Abschnitt bei Männern. Der Verfasser ist vorsichtig genug, daräus noch keine weiteren Schlüsse zu ziehen. W. Riese (Frankfurt a/M.).

206. Laubmann, W., Gefässnerven zu den oberflächlichen Arterien des Kopfes. *Anat. Anzeig.*, 1924, **57**, 213.

Sorgfältige Präparation und bildliche Darstellung der oberflächlichen Gefässe und Nerven des Kopfes. Untersucht wurden die Nerven zur A. temp. superficialis, die Nerven zur A. max. externa, die Nerven zur A. occipitalis und zu deren Zweigen. Die Gefässe des Gesichtes werden nach des Verf. Untersuchungen nicht nur von den an ihnen aufsteigenden Plexus des Sympathicus, sondern ebenfalls direkt von Gehirnnerven (Facialis, Trigeminus) versorgt. W. Riese (Frankfurt a/M.).

207. Bielschowsky, M., Über die Oberflächengestaltung des Grosshirnmantels bei Pachygyrie, Mikrogyrie und bei normaler Entwicklung. *J. f. Psychol. u. Neurol.*, 1924, **30**, 29.

Das Problem der Hirnfurchung ist in der letzten Zeit wieder Gegenstand besonderen Interesses geworden. Schaffer vertritt die Auffassung, dass das primäre in der Entstehung der Hirnfurchung die Furche sei: bei foetalen, in der Furchung begriffenen Gehirnen sähe man die superficielle Körnerschicht keilförmig in die Tiefe wuchern; dieser Körnerkeil zerfalle im Centrum, und so entstehe eben die Furche. Diese Tatsachen werden von Bielschowsky angezweifelt. Er erblickt das primäre in der Windung, nicht in der Furche. Die äusseren Zellager der Corticalis rücken von innen nach aussen gegen den Randschleier vor. In dem Masse wie sich die Parenchymelemente, die Ganglienzellen, vermehren, entsteht die Windung. Bleibt-wie bei mikrogyren, pachygyren Hirnen-das zellige Bildungsmaterial in Form von Heterotopien in der Tiefe liegen,

erreicht es also auf seiner Wanderung von der Matrix zur Oberfläche nicht sein Ziel, bleibt die Rinde verschmälert, defekt, missgestaltet. Nach der Auffassung von Bielschowsky beeinflussen sich also Oberflächengestaltung und Schichtendifferencierung auf das engste, und zwar in der Weise, dass " die Entwicklung der Furchen und Windungen vom Rindenaufbau abhängig ist." W. Riese (Frankfurt a/M.).

208. Pawlow, I., Die normale Tätigkeit und allgemeine Konstitution der Grosshirnrinde. *Skand. Arch. f. Physiol.*, 1923, **44**, 32–41.

Berichtet in thesenartiger Form über die Grosshirnrinde auf Grund von mehr als 100 Arbeiten, die von 70–80 Mitarbeitern in dem Laboratorium des Verf.'s in Petersburg ausgeführt und fast nur in russischer Sprache veröffentlicht worden sind. Die Schilderung der Tätigkeit der Grosshirnrinde führt zu dem Bilde unzähliger, untereinander bunt abwechselnder, erregbarer und gehemmter (chronisch eingeschläferter) Punkte, die zu mehr oder weniger scharfen Abgrenzungen vereinigt sind. Die Schilderung der allgemeinen Konstitution der Grosshirnrinde geht von den zentralen Territorien aus, die jedem peripherischen rezeptorischen Apparat zugeordnet sind, und sieht ebenso das motorische Gebiet als eine rezeptorische Projektion des Bewegungsapparates an. O. Klemm (Leipzig).

209. Tilney, F., and Casamajor, L., Myelinogeny as Applied to the Study of Behavior. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 1–66.

In an attempt to get at a structural basis for the study of behavior, it was decided to test the application of Flechsig's myelinogenetic law, which states that the myelinization of the nerve fibers of the developing brain follows a definite chronologic sequence such that the fibers belonging to particular functional systems mature (assume their myelin sheaths) at the same time. The question asked by the investigators was, " What is the sequence in the development of reactions in the young growing animal, and may these several reactions be explained by specific reflex arcs? " The work was done chiefly on kittens, and consisted of three parts: (1) observation of the reactions of young animals from birth to adult life; (2) removal and study of the central nervous system from animals at the time

of birth and at each critical stage thereafter; and (3) correlation of the functional reactions at birth and each critical stage following, with the myelinized fiber systems appearing at these several periods of behavior development. The present report is devoted chiefly to the findings in the cat during the first fourteen days of life. By assuming a functional capacity as already established in certain fibers which are found to be myelinized at birth, the first behavioral components in the kitten may be explained on a basis of stimulus and response. Thereafter it is possible to recognize a definite chronologic sequence of well-defined behavioral reactions; and there is strong evidence that the deposition of myelin is coincident with the establishment of function in definite fiber systems involved in these reactions. The studies reported are complete and careful; one or two examples only may be cited here. In the six-day kitten the assumption of myelin sheaths in the optic nerves and tracts occurs; coincidentally appears the eye-opening reaction. Two other new behavioral reactions appear on the same day; the synergizing reaction (the introduction of coördinative control in the movements of head and body), which is established simultaneously with the myelinization in the spinocerebellar tracts, the vermis of the cerebellum, the superior cerebellar peduncle, and the rubrospinal tract; and the primitive escaping reaction, to get away from painful or hurtful stimuli, which appears at the same time that myelinization occurs in the spinothalamic tract. The only special sense which is provided with a completely myelinized system of fibers at birth, is the auditory sense; and it seems probable that this is the only one of the special senses which contributes to the directive influence guiding the early movements of the animal. The evidence of this study seems to support the hypothesis contained in Flechsig's law, and points to the possibilities of further investigations concerning the structural basis of behavior. While some investigators have reported findings which would indicate that these facts do not hold in the case of certain other animals, for example the white rat, the authors differ with these findings, and ask that judgment be reserved until a report based on a study of the white rat, now in process of preparation, be made. Such far-reaching conclusions as those of Flechsig, especially with regard to the evolution of psychic functions, on the basis of myelinogenesis, are felt to be premature, and must be based on much wider research on many different species, combined with an intensive study of behavior in the infant. B. M. CASTNER (Boston Psychopathic Hospital).

210. Mehrtens, H. G., Kolos, F., and Marshall, H., Tryparsamide Penetration into the Central Nervous Tissue With and Without Spinal Irritation. Comparison with Arsphenamin. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 67–72.

"(1) Tryparsamide was found to be positively chemotrophic for nervous tissue as compared with arsphenamin. (2) The spinal fluids of patients who had received previous injections of tryparsamide showed as much as two or three times as great arsenic concentration as those who had received intravenous injections of arsphenamin. (3) Spinal irritation increased the arsenic concentration from 25 to 30 per cent over those cases in which only intravenous tryparsamide was given. (4) Clinically it may be advantageous to add meningeal irritation to intravenous tryparsamide injections in neurosyphilitic cases resistant to therapy." B. M. Castner (Boston Psychopathic Hospital).

211. Thalhimer, W., Herpes Zoster; Central Nervous System Lesions Similar to Those of Epidemic (Lethargic) Encephalitis. Report of a Case. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 73–79.

The case reported showed certain microscopic lesions in the central nervous system which were similar in some respects to the type of lesions present in the brain and spinal cord of patients dying from epidemic encephalitis or poliomyelitis. The importance of further investigation of the possible relationship of epidemc encephalitis, herpes fibrilis, and herpes zoster is emphasized. B. M. Castner (Boston Psychopathic Hospital).

212. Linell, E. A., and Koster, B. McD., A Developmental Anomaly of the Cerebral Cortex. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 167–172. B. M. Castner (Boston Psychopathic Hospital).

3. SENSATION AND PERCEPTION

213. Frey, M. v., Erotic Sensations and Nerve Terminals. *Zeit. f. Geburtshülfe und Gynäk*, 1924, **87**, 256–260.

Observations on epicritic sensitivity indicate that lust sensations are not originated in Krause corpuscles or superficial nerve terminals. D. A. Laird (Colgate).

214. Clark, J. H., The Ishihara Test for Color Blindness. *Amer. J. of Physiol. Optics,* 1924, **5**, 269–276.

Description, with colored charts, of a modification of the Stilling test, with comparative results of tests with the Edridge-Green, the Stilling and this test. S. W. Fernberger (Pennsylvania).

215. Banister, J. M., The Special Types of Heterophoria Viewed in their Clinical Relations. *Amer. J. of Physiol. Optics,* 1924, **5**, 277–296.

Discussion of the clinical bearings of the special anomalies included under the general term heterophoria. S. W. Fernberger (Pennsylvania).

216. Laurance, L., Accommodation and Convergence. *Amer. J. of Physiol. Optics,* 1924, **5**, 297–320. S. W. Fernberger (Pennsylvania).

217. Allen, F., On Reflex Visual Sensations—I. Experimental. *Amer. J. of Physiol. Optics,* 1924, **5**, 341–375.

Working in light adaptation, the experimenter fatigued one eye and determined the flicker ratios with the other (unfatigued) eye. He finds that the effect of fatigue of the left eye has been transferred to the right eye by some reflex visual process and results in the enhancement of the brightness of the three spectral regions, red, green and violet. Further experiments were made with the right eye which had previously been fatigued while the left eye was kept in light adaptation and similar fatigue curves were obtained to those described above. These results are different from those fatigue curves obtained under dark adaptation and it was then shown that the effects of darkness adaptation may be transferred from one eye to the other and thereby conceals the reflex effect of whatever color stimulus was applied. The yellow and blue regions of the spectrum did not show these reflex relations. S. W. Fernberger (Pennsylvania).

218. Sheard, C., Some Theoretical and Practical Points of Interest in Visual Optics. *Amer. J. of Physiol. Optics,* 1924, **5**, 376–393.

Summary of some of the recent theoretical advances in physiological optics such as the electrical responses of the retina under

light stimulation, the "all or none" law in visual response and radiant energy and the eye. S. W. Fernberger (Pennsylvania).

219. Lehmann, W., Über eigenartige Beziehungen zwischen der Oberflächen- und Tiefensensibilität. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 309–316.

Verf. hat bei Erkrankungen der peripherischen Nerven und bei Rückenmarkskrankheiten (Spondylitis) öfters eine stark gesteigerte Schmerzempfindlichkeit für *tiefen* Druck und Kneifen der Haut bei sonst totaler Anaesthesie der *Haut* beobachtet. Thomas, der diese eigenartige Empfindungsdissoziation gleichfalls beschrieben hat (*Comptes rend. Soc. de Biol.*, 1917, Bd. 80), hat mitgeteilt, dass in solchen Fällen das Kneifen einer Hautfalte Angst- und Schweissausbrüche auslöst. Die *Lokalisation* des Schmerzes ist oft sehr ungenau (im Gegensatz zu dem Befund in Heads bekanntem Durchschneidungsversuch). Das Symptom ist auf das anaesthetische Gebiet beschränkt. Verf. hat es auch nach Resektion der hinteren Wurzeln des Rückenmarks festgestellt (auch experimentell bei dem Hund). Auffällig ist, dass es einerseits gerade auch bei *volkommener* Nervendurchtrennung auftritt und andrerseits doch sich keineswegs in *allen* Fällen findet. Verf. nimmt an (im Anschluss an Äusserungen von Goltz und von Goldscheider), dass das Phaenomen dadurch zustande kommt, dass "durch die Ausschaltung einer Reihe von Leitungsbahnen zugleich eine Reihe von beeinflussenden Erregungen eliminiert wird." Die normale Empfindung stellt von diesem Standpunkt aus das Resultat aus dem Zusammenwirken der verschiedenen Empfindungsarten dar. Th. Ziehen (Halle a/S.).

220. Weizsäcker, V. v., Untersuchung des Drucksinns mit Flächenreizen bei Nervenkranken (Phaenomen der Verstärkung). *Deutsche Z. f. Nervenheilk.*, 1924, **80**, 159–167.

Verf. hat bei verschiedenen Nervenkrankheiten (Tabes, Syringomyelie, Neuritis usf.) mit Hilfe des Hansenschen Hebels (*Z. f. Biol.*, 1913, Bd. 62) das "Verstärkungsphaenomen" untersucht, d.h. festgestellt, ob die zur Wirkung erforderlichen hydrostatischen Drucke wie bei dem Gesunden mit der Vergrösserung der gereizten Hautfläche abnehmen. Es ergab sich weder für die peripherischen noch für die zentralen Erkrankungen eine Abweichung von dem normalen Verhalten. Der summierende Einfluss des Zusammenwirkens benachbarter Erregungen war also nicht

geschmälert. Das Verstärkungsphaenomen ist also mit jeder Sinnestätigkeit, soweit sie überhaupt noch vorhanden ist, unlösbar verbunden. Eine Spezialfunktion der Hirnrinde (Deutung Heads) soll nach Verfasser nicht vorliegen. TH. ZIEHEN (Halle a/S.).

221. FEDOROW, N. T., Ueber die quantitative Bestimmung der Grundbegriffe der Farbenlehre. *Arch. f. d. ges. Physiol.*, 1924, 202, 429–434.

Ausgehend von der Young-Helmholtz-Lasareff'schen Dreifarbentheorie wird gezeigt, dass die aus den Lasareff'schen Grunderregungskurven (Lasareff: Jonentheorie der Reizung, 1923, Bern und Leipzig) berechneten Farbenwellenlängen besser mit Ostwalds experimentellen Werten übereinstimmen als die von Kohlrausch (Methode Helmholtz-Exner) berechneten. Folgen Definitionen für Farbhelligkeit und Weissgehalt: Helligkeit = Verhältnis der maximalen der 3 Grössen R, G, V einer Farbe zu derselben Grösse für die Reizung durch das von weisser Oberfläche zurückgeworfene Licht (R, G, V = Quantitäten des vom Licht zersetzten Stoffes in den entsprechenden lichtempfindlichen Pigmenten des Auges). Weissgehalt = Verhältnis der Differenz zwischen den minimalen von R, G, V für die Farbe und für die dem Farbton dieser Farbe entsprechenden monochromatischen Spektralfarben von gleicher Helligkeit wie vorliegende Farbe zum Werte derselben Grösse für das von weisser Oberfläche zurückgeworfene Licht. P. HAPPEL (Frankfurt a/M.).

222. KRAVKOV, S. W., Ueber das quantitative Gesetz des Abklingens der Nachbilder von weissen und farbigen Lichtreizen. *Arch. f. d. ges. Physiol.*, 1924, 202, 112–118.

Prüfungen an über 1000 Beobachtungen, wie weit das Lasareffsche Gesetz (Lasareff: *Ionentheorie der Reizung*, 1923) der Erfahrung entspricht, wenn die Dauer, Intensität und Qualität des Lichtreizes variiert wird, und wie sich die Abklingungskurven der Lichter verschiedener Qualität zueinander verhalten. Bei weissem Lichtreiz und primären roten und violetten Erregungen fand Verfasser gute Uebereinstimmung. Verhalten der Abklingungskurven zueinander: Rote Erregung sank in rascherem Tempo, dauerte aber länger als violette. Versuchsanordnung: Dunkelzimmer. Versuchsperson vor Mattglasplatte. Dahinter Lichtquelle. Reizdauervariation durch Geschwindigkeitsänderung einer vor der

Lichtquelle herabfallenden, geschlitzten Platte. Versuchsperson projiziert das Nachbild auf einen Lichtschirm, dessen Lichtquelle (in innen geschwärztem Rohr) bezüglich Entfernung variiert werden kann. Einstellung derselben durch Versuchsperson derart, dass Nachbild- und Lichtschirmhelligkeit gleich sind. P. Happel (Frankfurt a/M.).

223. Wada, Y., Beiträge zur vergleichenden Physiologie des Gehörsorgan. *Arch. f. d. ges. Physiol.*, 1924, **202**, 46–69.

Untersuchung der Trommelfellbewegung verschiedener Tiere durch kleine aufgesetzte Spiegel mit photographischer Registrierung eines Flammenbildes. Bei Amphibien, Reptilien, Vögeln und Säugern zeigen sich deutliche Mitschwingungserscheinungen bei Geräuschen und Tönen (Maximum bei a^3–a^4). Spezielle Untersuchung an Tauben ergab, dass *verschiedene Stellen* des Trommelfells bei dem *selben Ton* verschieden und dass bei *verschiedenen Tönen* die *selbe Stelle* verschieden schwingt, und dass (im Gegensatz zum Säuger) der Musculus tympani keine reflektorische Verkürzung zeigt, sondern als Tonusmuskel die Spannung des Trommelfells konstant erhält. Nach dem Tode, sowie in tiefer Narkose oder nach Durchschneidung des Musc. tymp. fallen die Mitschwingungen bei Tönen von einer bestimmten Tiefe an aus. Die Bewegung des Trommelfells der einen Seite wird durch Kommunikation der pneumatischen Räume des Schädels auf das andere Trommelfell übertragen. E. Fischer (Frankfurt a/M.).

224. Halpern, F., Ueber Raumwahrnehmungen mittels des Wärmesinnes. *Arch. f. d. ges. Physiol.*, 1924, **202**, 274–277.

Mit Hilfe eines Wärmezirkels wurde unter Vermeidung der Berührung der Tastpunkte an vier normalen Vp. die Simultanschwellen für zwei resp. für drei Wärmepunkte festgestellt. Die Schwelle betrug bei zwei Punkten 4–5 cm., drei Punkte wurden von 3,5–4 cm. als zwei Punkte bei grösserer Distanz als drei Punkte erfasst. (Die Auffassung " drei Punkte " erfolgte bei Dreiecksanordnung eher als bei gerader Anordnung). Bei einem Kranken mit Brown-Séquardschem Syndrom ergaben sich niedrigere Schwellen in einem völlig anästhetischen Hautbezirk. Erwärmte Blechfiguren wurden im Gegensatz zu nicht erwärmten genau erkannt. E. Fischer (Frankfurt a/M.).

225. Ruttin, E., Über den Nachweis von Hörresten. *Arch. f. Ohren-Nasen u. Kehlkopfheilkd.*, 1924, 111, 102–110.

Bei sicherer einseitiger Taubheit ändert sich der Ton einer Stimmgabel vor dem hörenden Ohre nicht, wenn dem tauben Ohre ein mehrfach unterbrochener Ton derselben Stimmgabel zugeführt wird, wohl aber sofort wenn ein zweiter Ton, durch Aufsetzen der Stimmgabel auf den Scheitel mit Unterbrechungen durch den Knochen zugeführt wird. Sobald aber Hörreste vorhanden sind, ändert sich der Ton schon im ersten Falle. Die Versuche haben Bedeutung für die Lehre von der zentralen Entstehung der Schwebungen bei getrennter Zuführung der Stimmgabeltöne zu den beiden Ohren. O. Klemm (Leipzig).

226. Weizsäcker, V. v., Über die Sensibilität, insbesondere den Drucksinn, vom physiologischen Gesichtspunkte aus. *Klin. Woch.*, 1923, 2, 2109–2112.

Eine Übersicht über die Leistungen des Hautsinnesorgans sowie die der Tiefensensibilität dienenden Organe. Rezeptivität und Motilität stehen hier in einer eigenartigen Verschlingung, da auch ihre Organe teilweise übereinstimmen. O. Klemm (Leipzig).

227. Skramlik, E. v., Über das Verhalten des Geruchssinns bei gleichzeitiger Einwirkung zweier Reize. *Klin. Woch.*, 1923, 2, 1250–1253.

Aus den Duftstoffgemischen können vielfach die Komponenten herausanalysiert werden. Manche Gerüche neigen dazu "Verschmelzungen" einzugehen, und lassen sich dann schwerer analysieren. Die Verschmelzung lässt sich zu den quantitativen und qualitativen Komponenten in Beziehung setzen, aus denen die Mischung gewonnen wurde. Analogien zu dem Verhalten des Sehorgans finden sich in den Erscheinungen des "Wettstreites." O. Klemm (Leipzig).

228. Steichen, A., Färbung rotierender Scheiben bei doppelter Beleuchtung. *Physik. Z.*, 1923, 24, 112–114.

Wenn man eine Schwarz-Weiss-Scheibe rasch rotieren lässt, und sie dabei gleichzeitig mit stetigen und mit intermittierendem Lichte beleuchtet, so erhält man ein schönes Spiel komplementärer Farben. Der Verf. sucht die Erklärung hierfür in einer Analogie zu den Erscheinungen der farbigen Schatten. O. Klemm (Leipzig).

229. Panconcelli-Calzia, G., Ein Verfahren, um graphisch gewonnene Schallaufnahmen auf dem üblichen glyphischen Wege (Sprechmaschine) wieder hörbar zu machen. *Ann. d. Physik.*, 1923, **70**, 250–255.

Bei dem gewöhnlichen glyphischen Verfahren schreibt man die Schallschwingungen in den Stoff, und kann sie auf jeder Sprechmaschine wieder abhören. Bei dem graphischen Verfahren dagegen schreibt man auf den Stoff (z. B. das berusste Papier des Kymographions) und kann nicht unmittelbar abhören. Der Verf. gibt eine geistreiche Verbindung der beiden Verfahren an, bei der namentlich eine sehr genaue Ausmessung von Klangfarbe, Tonhöhe und Dauer möglich ist. O. Klemm (Leipzig).

230. Meyer, E., Ponderomotorische Wirkungen von Tonwellen auf resonierende Membranen. *Ann. d. Physik.*, 1923, **71**, 567–590.

Die Wechselwirkungen zwischen Schallwellen und Resonatoren werden unter Ausschaltung der übrigen ponderomotorischen Kräfte des Schalles untersucht. Als Schallquelle dient ein Telephon, als Resonator eine kreisförmige Membran aus dünner Gummihaut. Die quadratische Abhängigkeit von der Amplitude der Telephonmembran bestätigt sich. Der für die Wechselwirkung wichtige Phasenunterschied zwischen den beiden Membranen wird photographisch festgehalten und mit Theorie verglichen. O. Klemm (Leipzig).

231. Kleiner, W., Über den grossen schweizerischen Stammbaum, in dem mit Kurzsichtigkeit kombinierte Nachtblindheit sich forterbt. *Arch. f. Rassen u. Gesellsch.-Biol.*, 1924, **15**, 1–17.

An einem sehr ausführlichen Stammbaume wird nachgewiesen, dass die Hemeralopen regelmässig eine myopische Refraktion haben, die oft mit Astigmatismus kombiniert ist. O. Klemm (Leipzig).

232. Carrière, R., Über Erblichkeit und Rasseneigentümlichkeit der Finger- und Handlinienmuster. *Arch. f. Rassen u. Gesellsch.-Biol.*, 1924, **15**, 151–155.

Es gibt Struktureigentümlichkeiten des Handlinienmusters, die zwar erblich sind, aber nur in Form einer Tendenz zur Wiederholung dieser Strukturen: es bleibt dabei ein Spielraum, an welcher Hand und an welchem Finger diese Variationen auftreten. O. Klemm (Leipzig).

233. Wodak, E., u. Fischer, M. H., Beiträge zur Physiologie des menschlichen Vestibularapparates. *Monatssch. f. Ohrenheilk.*, 1924, **58**, 70–95.

Der Vestibularapparat ist nicht nur ein Reflexapparat, sondern auch ein Sinnesorgan. Die vorliegende experimentelle Studie richtet sich auf die Drehempfindungen (Zirkularvektionen) bei aufrechter Körperhaltung, geschlossenen Augen und fixiertem Kopfe. Es entstehen hierbei Zirkularvektionen von bestimmter Qualität (Celerität und Vektorialität) mit einem gesetzmässigen rhythmischen Phasenablauf. Nach einer gewissen Anzahl gleichförmiger Kreisbewegungen tritt vollständige Adaptation ein, und die Zirkularempfindung verschwindet. O. Klemm (Leipzig).

234. Kobrak, F., Über den Bergschwindel und andere praktisch wichtige Schwindelphänomene. *Monatssch. f. Ohrenheilk.*, 1924, **58**, 126–133.

Während Seekrankheit und Fahrstuhlübelkeit hauptsächlich aus dem Labyrinthe stammen, ist der Bergschwindel zum grossen Teile optisch bedingt. Die optischen und okulomotorischen Faktoren assoziieren sich mit vestibulären Reizzuständen und erzeugen so einen richtigen Drehschwindel. Auch der blosse Angstaffekt kann bei geschlossenen Augen und ruhendem Körper zu einem Drehschwindel führen. O. Klemm (Leipzig).

235. Hofmann, F. B., Über die Grundlagen der egozentrischen (absoluten) optischen Lokalisation. *Skand. Arch. f. Physiol.*, 1923, **43**, 17–34.

Die Erörterung der relativen und der absoluten Lokalisation im Raume führt dazu die egozentrische Lokalisationsweise des Gesichts- und des Tastsinnes bei der Orientierung im Raume in ihrer wichtigen biologischen Bedeutung zu erkennen: Sie hängt nämlich mit den willkürlichen Innervationen im Ich zusammen, das den gemeinsamen Träger für die Sensibilität und die Motilität abgibt. O. Klemm (Leipzig).

236. Kestner, O., Sinnesphysiologisches zur Relativitätstheorie. *Skand. Arch. f. Physiol.*, 1923, **43**, 35–38.

Die Gedankengänge der Relativitätstheorie finden in manchen sinnesphysiologischen Eigentümlichkeiten eine Bestätigung: immer wieder erfahren wir es, dass alle Massstäbe für die erlebte Zeit relativ

sind. Ebenso erweist sich die überlegenheit der uns zur Messung dienenden Sinne, Tast- und Gesichtssinn, über die andern nur als relativ. O. KLEMM (Leipzig).

237. FREY, M. v., Über die Beziehungen zwischen Kitzel-Berührungs- und Druckempfindung. *Skand. Arch. f. Physiol.*, 1923, **43**, 93–100.

Der Kitzel wird durch die Nerven des Drucksinnes vermittelt, das Jucken dagegen ist eine Leistung der oberflächlichen Schmerznerven. Die besonderen Qualitäten des Kitzels sind oft durch zentrale Einstellungen gegeben, denen die Neigung der Druckerregungen entgegenkommt, sich zu einheitlichen Komplexen zusammenzuschliessen. O. KLEMM (Leipzig).

238. POIROT, J., Über die rhythmischen Pausen im Vortrage und deren experimentelles Studium. *Skand. Arch. f. Physiol.*, 1923, **43**, 120–127.

Teilt die Ergebnisse einer genauen Registrierung Ausmessung der Pausenlängen beim Vortrage von Prosastücken mit (Stellen aus Flaubert, Madame Bovary). Es ergeben sich Pausen verschiedener Ordnung, die von einer mittleren Dauer von etwa 1 Sek. bis hinunter zu mittleren Dauern von 0.15 Sek. gehen. O. KLEMM (Leipzig).

239. ÖHRWALL, H., Eine Theorie des Farbensinns. *Skand. Arch. f. Physiol.*, 1923, **43**, 165–194.

Der Verf. geht von der Duplizitätstheorie aus, welche die Stäbchen als "Dämmerungsorgane" auffasst, während die Zapfen beim "Tagessehen in Funktion treten. Die Zapfen haben sich aus einem einfacheren Sinnesorgan entwickelt, welches die Fähigkeit der Lichtempfindung, nicht aber die der Farbenempfindung besass. Diese Zapfen differenzierten sich zunächst in zwei Arten mit verschiedenen photochemischen Substanzen, deren eine für Licht mit grosser Wellenlänge (Gelb) und deren andere für Licht mit kleiner Wellenlänge (Blau) besonders empfindlich ist. Aus diesem dichromatischen Farbensinn entwickelt sich durch Differenzierung des Gelbzentrums in rot- und grünempfindliche Bestandteile der normale trichromatische Farbensinn. Die verschiedenen Arten von angeborenen Farbenanomalien sind demnach als Atavismen zu betrachten. Die vier Grundfarben und die Empfindung Weiss sind nach dieser Theorie nicht als Qualitäten, sondern im Sinne von Helmholtz als Modalitäten

zu bezeichnen. Der Gesichtssinn bleibt dabei eine physiologische Einheit, ebenso wie das Auge mit dem Zentralorgan und den Leitungsbahnen eine anatomische Einheit ist. O. KLEMM (Leipzig).

240. RANCKEN, D., Über die Bedeutung gewisser Sinneseindrücke für unsere Muskelkraft und unser Befinden. *Skand. Arch. f. Physiol.*, 1923, **43**, 328–349.

Die Muskelkraft wurde an einem Handdynamographen bestimmt und verschiedenen experimentellen Bedingungen unterworfen. So wurden in der ersten Versuchsreihe der arbeitende oder der nicht arbeitende Arm verschieden abgestuften Spülungen ausgesetzt. In der zweiten versuchsreihe wurde ein grosser Teil der Körperoberfäche während der Arbeit mittels eines nassen Frottierhandschuhs feucht gehalten. In der dritten Versuchsreihe wurde der Einfluss der Jahreszeiten untersucht. Es zeigte sich hierbei, dass unsere Muskelleistungen in sehr komplizierter Weise von den äusseren Reizen abhängig sind. Eine volle Ausnutzung der vorhandenen Muskelkraft kommt nur zu Stande, wenn unsere Willensimpulse durch die Rezeption passender Sinneseindrücke unterstützt werden. Unser Zentralnervensystem muss "angespornt" werden durch "Rezeptionshiebe" von verschiedenen Seiten. O. KLEMM (Leipzig).

241. FELIX, K., u. FREY, M. v., Versuche über den Hautkitzel. *Z. f. Biol.*, 1923, **78**, 45–62.

Der Hautkitzel (im Gegensatz zu dem tiefen oder Muskelkitzel) ist von dem Jucken streng zu scheiden. Dies lehrt die Verschiedenheit der Schwellenwerte, der Reaktionsdauer, der Nachdauer und der mit den Empfindungen verknüpften Reflexe. Der Hautkitzel wird durch den Drucksinn vermittelt: dafür spricht die Übereinstimmung der Schwellen für Kitzel und Berührung, die Verschiedenheit der Schwelle an behaarten und unbehaarten Hautstellen und ihre Erhöhung nach Entfernung der Haare. Die besonderen Qualitäten des Kitzels entspringen vermutlich aus der räumlichen und zeitlichen Zusammenordnung der in den einzelnen elementaren Rezeptoren des Drucksinns auftretenden Erregungen. O. KLEMM (Leipzig).

242. HOFMANN, F. B., Zur Theorie des Geruchsinns. II. Über die sogenannte Geruchsermüdung. *Z. f. Biol.*, 1923, **78**, 63–90.

Aus der Komponententheorie des Verf's, nach der ein chemisch

einheitlicher Riechstoff mehrere Empfangsapparate von verschiedener spezifischer Energie zu erregen vermag, fliesst eine Erklärung für einige sogenannte Ermüdungserscheinungen des Geruchssinns. So kann sich der Geruch eines Stoffes nach vorherigem Riechen an einem andern ändern, weil eben ein Partialkomponente ermüdet ist. Aus demselben Grunde vermag der Geruch beim wiederholtem Riechen an demselben Riechstoffe umzuschlagen. Z. B. verschwindet bei den meisten Versuchspersonen der Bittermandelgeruch nach wiederholtem Riechen an Nitrobenzol. Man kann auch einen Geruch durch vorheriges Riechen an einem andern Stoff ganz vernichten. Nach dem Riechen an knozentriertem Ionon verschwindet der Geruch von Veilchen, und auch von Reseda und Teerosen: Hier handelt es sich um eine Lähmung der anderen Empfangsapparate durch den ersten Riechstoff. O. Klemm (Liepzig).

243. Fruböse, A., u. Jaensch, P. A., Der Einfluss verschiedener Faktoren auf die Tiefensehschärfe. *Z. f. Biol.*, 1923, **78**, 119–132.

Die zur binokularen Tiefenwahrnehmung erforderliche binokulare Parallaxe ist auch für eine einzelne Versuchsperson keinekonstante Grösse. Die eben merkliche Verschiebung ist vielmehr nach vorn und nach hinten verschieden. Die Tiefensehschärfe ist ferner vom seitlichen Abstand der Vergleichsfäden, von ihrer Länge und von der Beleuchtung abhängig. Schliesslich wird der eben erkennbare Disparationswinkel mit wachsendem Abstande der Objekte vom Beobachter merklich kleiner. O. Klemm (Leipzig).

244. Hofmann, F. B., u. Nussbaum, F., Über die makulare Dunkeladaptation der total Farbenblinden. *Z. f. Biol.*, 1923, **78**, 251–258.

Nach der Duplizitätstheorie erfolgt das Sehen des dunkeladaptierten Auges ausschliesslich vermittelst der Stäbchen. Der total Farbenblinde, dessen Zapfen funktionsunfähig sind, müsste nun mit der macula, wenn sie Zapfen enthielte, gar nichts sehen, oder wenn sie Stäbchen enthielte, ebenso adaptieren können, wie mit der Netzhautperipherie. An einem genauer untersuchten Falle von totaler Farbenblindheit zeigte sich aber, dass trotz des Fehlens eines Hellskotoms bei Dunkeladaptation eine analoge makulare Minderwertigkeit im blauen wie im roten Lichte auftrat, wie beim Normalen.

Die Maculafunktion der total Farbenblinden kann also nur mit Vorsicht für die Farbentheorien herangezogen werden. O. KLEMM (Leipzig).

245. STRUGHOLD, H., Die Wirkung der Kampfstoffe Diphenylarsinchlorid (Blaukreuzstoff) und Äthylarsinchlorid auf die Haut des Menschen. *Z. f. Biol.*, 1923, **78**, 195–230.

Bei Einwirkung der Giftsoffe auf die Haut wurden folgende Änderungen der Empfindung beobachtet: Die Punktschwelle des Drucksinns steight erheblich an, die Schmerzschwelle ändert sich im Verlaufe der Hautaffektion in komplizierter Weise, der spontane Schmerz hat eine sehr lange Latenzperiode, der Wärmesinn bleibt nahezu unverändert, der Kältesinn dagegen erleidet eine starke Herabsetzung. Hieraus ist auf eine Schichtung der Nervenenden in der Haut zu schliessen: Am oberflächlichsten enden die Schmerznerven, dann folgen die Endorgane des Kältesinns, und auf diese erst die Endorgane des Drucksinns und des Wärmesinns. O. KLEMM (Leipzig).

246. FREY, M. v., Die vier Empfindungsarten des Drucksinns. *Z. f. Biol.*, 1923, **79**, 303–306.

Der Drucksinn der Haut vermittelt vier Arten von Empfindungen, die als Berührung, Kitzel, Schwirren und Druck bezeichnet werden. Berührung und Kitzel entstehen beide durch schwache Reize, besonders wenn diese über die Haut wandern. Schwirren kann durch Stimmgabeln erzeugt werden. Druckempfindungen entstehen bei grossflächiger Deformation der Haut. Von jedem Druckpunkte aus lassen sich alle vier Empfindungsarten erzeugen. Ihre Qualitätsunterschiede rühren daher, dass die in den peripheren Empfangsapparaten gesetzten Erregungen nicht unverändert nach dem Zentrum geleitet werden, sondern mit einander verschmelzen und neue Komplexe eingehen. Es ergeben sich von hier aus Beziehungen zu der neueren Gestalttheorie, welche beim Zusammenschluss von Empfindungen zu psychischen Gebilden ein ähnliches Ineinandergreifen der physiologischen Prozesse annimmt. O. KLEMM (Leipzig).

247. BLUMENTHAL, A., Zur Erklärung des kalorischen Nystagmus. *Beitr. z. Anat., Physiol., Pathol. u. Therap. d. Ohres, d. Nase u. d. Halses*, 1924, **20**, 307–328.

Aus genaueren Versuchen mit kalorischer Labyrinthreizung geht

hervor dass, ihr Einfluss auf den Nystagmus je nach der Reizstärke verschieden ist. Aus den nystagmischen Erscheinungen lassen sich keine sicheren Schlüsse auf die Richtigkeit der Endolymphströmungstheorie ziehen. Wenn man durch Suprarenininjektion eine künstliche Kontraktion der kleinen Gebässe herbeiführt, zeigt sich ein so erheblicher Einfluss auf den kalorischen Nystagmus, dass in der kalorisch erzeugten, reflektorischen Veränderung des Gefässtonus der Labyrinthgefässe überhaupt die wichtigste Ursache für die Erregung der vestibulären Nervenelemente zu vermuten ist. O. KLEMM (Leipzig).

4. FEELING AND EMOTION

248. POFFENBERGER, A. T., and BARROWS, B. E., The Feeling Value of Lines. *J. of Applied Psychol.*, 1924, **8**, 187–205.

The authors think that border designs in advertising are prepared merely for their general esthetic effect and for the purpose of novelty. They might be more effectively used by taking account of the relation between quality, direction and rhythm of line and the feelings that are aroused in seeing them. An experiment was performed on 500 persons, each being asked to choose a line to represent each of the 13 classes of feelings—sad, quiet, lazy, merry, agitating, furious, dead, playful, weak, gentle, harsh, serious, powerful. The results were compared with those Lundholm found in his experiments. E. MULHALL ACHILLES (Columbia).

5. MOTOR PHENOMENA AND ACTION

249. HOSKINS, R. G., and DURANT, E. P., The Effect of Fatigued Muscle Upon Perfused Adrenalin. *Amer. J. Physiol.*, 1923, **66**, 176–179.

Systemic effects the same whether perfused in rested or in fatigued muscle. D. A. LAIRD (Colgate).

250. GALANT, J. S., The Eyelid Reflexes, *Arch. f. Kinderheilk.*, 1924, **74**, 130–134.

Reflexes disappear upon death while pseudo-reflexes due to autonomous muscular response persist. Many alleged eyelid reflexes were obtained from cadavers. D. A. LAIRD (Colgate).

251. Brodsky, J., Die Heteroplastik der endokrinen Drüsen bei Erkrankungen des Nervensystems. *J. f. Psychol. u. Neurol.*, 1924, **30**, 77.

Der Autor berichtet über 2 Fälle von wohlgelungener Heteroplastik der Epithelkörperchen von Ziegen auf tetaniekranke Menschen. Die heteroplastische Methode hat zunächst gegenüber der homoplastischen den Vorteil, dass man jederzeit das zur Überpflanzung notwendige Material verfügbar machen kann. Die Ziege wurde deswegen als das zur Überpflanzung der Nebenschilddrüse geeignetste Tier gewählt, weil auf Grund ausführlicher Voruntersuchung gefunden wurde, dass der Katalaseindex ihres Blutes (A. Bach und S. Zuokowa, Über die Fermentzahlen des Blutes. *Biochem. Z.*, Band 125) maximal ist im Vergleich zu dem des Menschen; insbesondere wurde unter den zur Verfügung standenden Ziegen diejenige ausgewählt, die unter ihresgleichen einen Maximalindex hatte. Da der Autor der Ansicht ist, dass die Misserfolge der Heteroplastik auf un zweckmässige Aufbewahrung der exstirpierten Drüse in dem ihr widernatürlichen Milieu der physiologischen Kochsalzlösung und dem Glyzerin-Ringer zurückzuführen sind, hat er die Epithelkörperchen des Ursprungstieres zu gleicher Zeit entfernen lassen, wie die Operation an den Patienten ausgeführt wurde (Einpflanzung der Drüse in eine kleine, durch Abpräparieren längs der Musculi recti abdominis angefertigte Tasche. W. Riese (Frankfurt a/M.).

252. Matthaei, R., Nachbewegungen beim Menschen. (Untersuchungen über das sog. Kohnstamm'sche Phänomen.) *Arch. f. d. ges. Physiol.*, 1924, **202**, 88–111.

Matthaei geht von dem bekannten Kohnstamm'schen Versuch aus, bei dem auf ein längeres Anstemmen eines Armes gegen einen Widerstand beim Freilassen des Armes eine (oder mehrere) langsame Bewegungen des Armes in der früheren Druckrichtung erfolgt. Es wird gezeigt, dass der Versuch an sehr verschiedenen Muskelgruppen des Armes und der Beine gelingt. Der Einfluss der Dauer der Muskelanstrengung wird untersucht und es wird nachgewiesen, dass nach Ausführung des Versuchs das Gewicht des betreffenden Gliedes leichter empfunden wird. Die Erscheinungen werden in Zusammenhang gebracht mit zentralen Nacherregungen, die sich auch am Frosch demonstrieren lassen. A. Bethe (Frankfurt a/M.).

253. Plaut, R., Beobachtungen zur Sperrung des Skelettmuskels. *Arch. f. d. ges. Physiol.*, 1924, **202**, 410–428.

Die Verfasserin sucht dem Tonusproblem durch den Vergleich der Muskelhärte und des Gaswechsels bei gesunden Menschen und solchen mit nervösen Erkrankungen (Rigor, Katatonie, etc.) näher zu kommen. Amputierte, bei denen ein Einfluss der Antagonisten ausgeschlossen ist, sind imstande, ihre Muskeln willkürlich entweder zu " sperren " so dass sie bei verschiedenen Belastungen ihre Längen behalten, oder sie zu verkürzen. Hieraus wird geschlossen, dass es eine von der Verkürzung unabhängige Sperrungsinnervation auch beim Menschen gibt. Diese tritt nur beim belasteten Muskel zutage. Bei krankhaften Zuständen welche mit einer Neigung zu starker Spannung der Skelettmuskeln verbunden sind (Katatonie, Rigor, etc.) Zeigte sich der Stoffverbrauch gegenüber der Ruhe nicht vermehrt, wenn grossen Gewichten das Gleichgewicht gehalten, also sogenannte statische Arbeit geleistet wurde. Bei gesunden Menschen ist aber mit " statischer Arbeit " stets ein erhölter Stoffverbrauch verbunden, weil sie bei diesen im wesentlichen auf dem Wege tetanischer Erregung zustande kommt. Daraus ergibt sich, dass auch die Muskeln des Menschen unter Umständen in einen echten Tonuszustand kommen können. A. Bethe (Frankfurt a/M.).

254. Matthaei, R., Nachbewegungen beim Menschen. *Klin. Woch.*, 1923, **2**, 2285.

Nach etwa halbminutenlanger starker willkürlicher Muskelanspannung tritt an allen kräftigen Muskeln des Menschen eine rhythmische Nachbewegung ein. Sie beruht auf einer in den subkortikalen Zentren noch vorhandenen " Dauererregung." O. Klemm

255. Asher, L., Über die Beziehungen zwischen Nervenerregung und Frequenz der elektrischen Reize. *Skand. Arch. f. Physiol.*, 1923, **43**, 6–12.

Nach einer neuen Methode zur Erzeugung hochfrequenter Schwingungen werden am Frosch bis zu Frequenzen von 300,000 glatte Tetani erzielt. Bei Perioden zwischen 10,000 und 300,000 besteht zwischen Frequenz und Schwellenreiz eine direkte Proportionalität. O. Klemm (Leipzig).

256. Tigerstedt, C., u. Kallioinen, L., Beitrag zur Kenntnis der Wirkung der Alkoholkonzentration auf die Leistungsfähigkeit der Muskeln. *Skand. Arch. f. Physiol.*, 1923, **43**, 87–92.

Die Verf. schliessen aus ihren Versuchen: " Das Vermögen eines

Menschen grobe Muskelkraft zu entwickeln, wird bei Genuss von täglich 35 gr Alkohol von Tag zu Tag vermindert. Bei einer 40 per cent Verdünnung des Alkohols ist diese Verminderung veil beträchtlicher als bei 8 per cent Verdünnung, wobei in beiden Fällen absolut genommen, die gleichen Alkoholmengen genossen werden." O. KLEMM (Leipzig).

257. DUSSER DE BARENNE, J. G., Untersuchungen über die Aktionsströme der quergestreiften Muskulatur bei der Enthirnungsstarre der Katze und der Willkürkontraktion des Menschen. *Skand. Arch. f. Physiol.*, 1923, **43**, 107–119.

Die hohe Frequenz der Aktionsströme bei der Willkürkontraktion des menschlichen Muskels stammt nicht aus einer "autochthonen" Erregungsfrequenz der peripheren motorischen Neuronen, sondern sie entsteht aus einer Interferenz von zentripetalen, propriozeptiven Impulsen mit der eigenen Erregungsfrequenz der motorischen Rückenmarksapparate. O. KLEMM (Leipzig).

258. RENQVIST, Y., Der Blutdruck in der Arteria brachialis bei verschiedenen Lagen des Armes und des Körpers. *Skand. Arch. f. Physiol.*, 1923, **43**, 128–137.

Der in der arteria brachialis herrschende Blutdruck ist in komplizierter Weise von der Körperlage abhängig. Um die Ergebnisse von Blutdruckmessungen verschiedener Versuchspersonen zu vergleichen, ist es am besten, die Messung bei horizontaler Körperlage mit längs der Seite ruhendem Arme auszuführen. O. KLEMM (Leipzig).

259. EBBECKE, U., Der idiomuskuläre Wulst und seine Beziehung zu Dauerverkürzung und Erregungsleitung. *Skand. Arch. f. Physiol.*, 1923, **43**, 138–164.

Die quergestreifte Muskelfaser zeigt zwei Arten von Kontraktion: eine rasche Zuckung und eine langsamer entstehende und vergehende Verkürzung, die entweder eine Wulstbildung oder eine Dauerverkürzung ist. Neben der gewöhnlichen raschen Kontraktionswelle von einigen Metern Geschwindigkeit gibt es noch eine langsame Welle von nur einigen Zentimetern Geschwindigkeit. Es ergeben sich

mehrfach Beziehungen zu den Verhältnissen der Erregungsleitung im Nerven. O. Klemm (Leipzig).

260. Garten, S., u. Kleinknecht, F., Ein Beitrag zur experimentellen Veränderung der Pulsform. *Skand. Arch. f. Physiol.*, 1923, **43**, 195–214.

Die experimentelle Veränderung bestand in einer Kompression des Oberarmes mit der Recklinghausenschen Manschette. Hierdurch liessen sich in normalen Kurven des Radialispulses, in denen Zwischenschlag und Nebenschlag gut ausgeprägt waren, diese Schlagformen zum Verschwinden bringen. Es entstand ausserdem eine Vergrösserung der Pulslatenz, d. i. der Zeit zwischen dem Beginn des Elektrokardiogramms und der Pulskurve, von O. 20 Sek. auf. 0.30 Sek. O. Klemm (Leipzig).

261. Benedict, F. G., u. Benedict, C. G., Ein einfacher Respirationsapparat. *Skand. Arch. f. Physiol.*, 1923, **44**, 87–102.

Das Respirationssystem besteht aus einem mit Natronkalk gefüllten Metallkasten, einer Badekappe für die Ausdehnung, und den zugehörigen Ventilen, Schläuchen und Mundstücken. Die Versuchsperson atmet aus der sauerstoffreichen Luft des Kastens, und in dem Masse als Sauerstoff absorbiert wird, wird trockene Zimmerluft mit einer geeichten Pumpe in den Kasten getrieben. Aus dem Volumen der Kolbenstösse der Pumpe, aus Temperatur Luftdruck und der verbrauchten Zeit lässt sich der Sauerstoffverbrauch berechnen. O. Klemm (Leipzig).

262. Renqvist, Y., Über die Form der Carotis- und Radialispulse bei verschiedenen Rumpf- und Armlagen. *Skand. Arch. f. Physiol.*, 1923, **44**, 143–166.

Die Pulsregistrierung wurde mit einem Aufnahme-Gummiballon und der Frankschen Herztonkapsel vorgenommen. Aus der Fülle des Beobachtungsmaterials hebe ich das für psychologische Untersuchungen besonders wichtige Verhalten der Radialispulskurve heraus: Je mehr der Arm abwärts gerichtet ist, umso steiler steigt die Kurve an, und um so grösser ist im allgemeinen ihre Amplitude und auch der dikrotische Anstieg. O. Klemm (Leipzig).

263. Arborelius, M., u. Liljestrand, G., Muskelarbeit und Blutreaktion. *Skand. Arch. f. Physiol.*, 1923, **44**, 215–236.

Nach dem Verfahren von Hasselbalch wurde die Wasserstof-

fionenkonzentration des Blutes im Zustande der Ruhe und der Arbeit bestimmt. Das Kohlesäurebindungsvermögen des Blutes nahm während der Arbeit ab, während die alveolare Kohlensäurespannung, individuell verschieden, bald eine kleine Steigerung, bald eine Erniedrigung zeigte. O. KLEMM (Leipzig).

264. KNIPPING, H. W., Respiratorischer Gaswechsel, Blutreaktion und Blutphosphorsäurespiegel bei geistiger Arbeit. *Z. f. Biol.*, 1923, 77, 165–174.

Bisher hat man sich bei der Messung geistigen Arbeit hauptsächlich darum bemüht die geistige Arbeit mit Hilfe des Respirationskalorimeters in Kalorienwerte zu übertragen. Nun sind aber die Kalorienwerte der geistigen Arbeit im Vergleich mit denen der körperlichen so klein, dass man sie nicht ernstlich als Arbeitswerte anerkennen möchte. Aus den Veränderungen des respiratorischen Quotienten ist vielmehr zu vermuten, dass der spezifische Effekt der geistigen Arbeit in dem Übertreten einer Säure ins Blut besteht. Diese Säure erweist sich als Phosphorsäure. Das Zentralnervensystem schwemmt bei der geistigen Arbeit Phosphorsäure aus, und dieser Blutphosphorsäurespiegel ist das eigentliche Symptom für die geistige Arbeit. O. KLEMM (Leipzig).

265. FELIX, K., Eigenreflexe und Nervenleitungsgeschwindigkeit beim Menschen. *Z. f. Biol.*, 1923, 77, 231–240.

Da die von der Erregung zurückgelegte Nervenstrecke beim Menschen niemals exakt zu messen ist, lässt sich auch die Geschwindigkeit der Nervenleitung nur annähernd finden. Man kann die Annäherung verbessern, indem man eine möglichst lange Nervenstrecke wählt, z. B. jene, die von den Sehnenreflexen des Fusses in Anspruch genommen wird. Bei Reizung des zugehörigen Nerven zeigt sich die Erregung der motorischen Fasern in einer kräftigen Zuckung mit einem schön ausgebildeten Aktionsstrom. Die Erregung der sensibeln Fasern aber wird über das Rückenmark auf die motorische Bahn des gleichen Muskels überstragen, und führt zu einer zweiten Zuckung, die ebenfalls durch ihren Aktionsstrom nachzuweisen ist. Aus dem Zeitabstand der beiden Aktionsströme ergibt sich die Geschwindigkeit der Nervenleitung beim Menschen zu 45 bis 50 m/sec. O. KLEMM (Leipzig).

266. Holliger, M., Untersuchungen über Ermüdung des Muskels. Nr. 1. Eine neue Methode zur Untersuchung der Ermüdung der willkürlichen Säugetiermuskulatur und die experimentelle Isolierung des relativ unermüdbaren Anteils derselben. *Z. f. Biol.*, 1923, **77**, 261–280.

Am unversehrten Tiere werden dauernd durch Nervenerregung Kontraktionen der Extremitätenmuskulatur hervorgebracht. Bei tetanisierenden Reizen schreitet die Ermüdung nicht bis zur endgiltigen Ermüdung des Muskels fort, sondern es bleibt ein nicht ermüdbarer Anteil der Muskelkontraktionen übrig. Es ist hierbei ein schwer ermüdbarer Anteil der quergestreiften Gliedermuskulatur experimentell isoliert. Die neueren Vermutungen über den Aufbau des Skelettmuskels aus zwei getrennten Anteilen und die autonome Innervation des Skelettmuskels erfahren hierdurch eine bedeutende Stütze. O. Klemm (Leipzig).

267. Schmid, E., Untersuchungen über Muskelermüdung. Nr. 2. Untersuchungen über Muskelermüdung des Säugetieres bei isometrischen Tetani und über den Einfluss des Sympathicus hierauf. *Z. f. Biol.*, 1923, **77**, 281–298.

Wenn man eine Muskelgruppe eines unversehrten Tieres unter möglichst physiologischen Bedingungen zu tetanischen, isometrischen Kontraktionen bringt, so erweist sie sich als praktisch unermüdbar. Dieselbe relative Unermüdbarkeit muss auch dem motorischen Nervenendorgan zugesprochen werden, da ja die Reizung vom Nerven aus stattfindet. Die hohen Kontraktionen (95 per cent der Anfangskontraktionshöhe) blieben während der ganzen Dauer der Versuche von 3–5 Stunden konstant. O. Klemm (Leipzig).

268. Marti, H., Fortgesetzte Untersuchungen über die Ermüdung des Muskels und ihre Beziehung zur parasympathischen Innervation. *Z. f. Biol.*, 1923, **77**, 299–316.

Mit der von Schmid u. Holliger benutzten Methode wird gezeigt, dass bei Reizung bis zur Vierer-Frequenz der Muskel unermüdbar ist, und erst von einer Reizfrequenz von jeder dritten Sekunde an Ermüdung eintritt. Nach Durchschneidung der hinteren Wurzeln ist die Ermüdung beim, Frosch hinausgeschoben, ebenso bei lokaler Injektion von parasympathisch erregenden Giften. Vermutlich über parasympathische Nerven in den hintern Wurzeln einen Einfluss auf die Muskeltätigkeit aus. O. Klemm (Leipzig).

269. Erni, M., Fortgesetzte Untersuchungen über die Funktion der Nebennieren nebst Nachweis von toxischen Stoffen in den Muskeln arbeitender, nebennierenloser Ratten. *Z. f. Biol.*, 1923, **78**, 315–330.

Im Zusammenhange mit der Frage nach den Ermüdungsgiften, die in der Psychologie ein Rolle spielt, hebe ich die Feststellung heraus, dass der Muskelpresssaft einer ermüdeten Ratte, nur wenn er von einem nebennierenlosen Tiere stammt und einem nebennierenlosen Tiere injiziert wird, schwere Ermüdungssymptome und Lebensgefahr hervorruft. Die Ermüdungsgifte werden also nur beim Fehlen der Nebenniere gebildet. O. Klemm (Leipzig).

270. Ackermann, M., Fortgesetzte Untersuchungen über die Ermüdung der Muskels. Nr. 4. Der Einfluss der Temperatur auf die Ermüdung der Muskulatur des unversehrten Frosches. *Z. f. Biol.*, 1923, **78**, 331–346.

Die Zeitdauer, nach welcher bei verschiedenen Reizfrequenzen Ermüdung eintritt, ist von der Temperatur abhängig, und zwar tritt mit Erhöhung der Temperatur, bis zu 35 Grad, die Ermüdung immer später ein. Bei wiederholter Reizung stellt sich ferner ein Gebiet optimaler Pausen heraus, das zwischen 1 Viertelstunde und 1 Stunde gelegen war. O. Klemm (Leipzig).

271. Hoffmann, P., Wo findet die Koppelung der Eigenreflexe mit anderweitigen Erregungen des Muskels statt? *Z. f. Biol.*, 1923, **78**, 347–352.

Die willkürliche Kontraktion des Muskels ist mit dessen Eigenreflexen gekoppelt, sodass jede willkürliche Erregung zwangsmässig zu einer Reflexsteigerung führt. Die Versuche an der enthirnten und an der geköpften Katze lehren nun, dass diese Reflexkoppelung im Rückenmarke vor sich geht. O. Klemm (Leipzig).

6. ATTENTION, MEMORY AND THOUGHT

272. Marston, W. M., Studies in Testimony. *J. Crim. Law and Crim.*, 1924, **15**, 5–31.

A very careful pair of experiments conducted on two groups of lawyers, one with and one without foreknowledge, to determine the relative accuracy, completeness, and caution in the three types of

legal testimony. Free narration is uniformly less complete and more accurate than direct or cross-examination. Direct examination is more complete and more accurate than cross-examination. Cross-examination shows greater caution than direct examination without gain, however, in either completeness or accuracy. A comparison of the two groups shows that foreknowledge of an event slightly increases the completeness of all types of reports, but decreases both accuracy and caution. A further comparison was made between the findings of judge and jury, both male and female, and the testimony on which these findings were based. In both completeness and accuracy the average judge was superior to the average jury; and the female judge and jury to the male judge and jury. M. S. CHILD (Boston Psychopathic Hospital).

273. STERN, H., Nachempfindungen bei Sensibilitätsstörungen als Folge gestörter Umstimmung (Adaptation). *Deutsche Z. f. Nervenheilk.*, 1924, **80**, 218–237.

Verf. hat die Untersuchungen von v. Frey über das allmähliche Abklingen eines konstant auf die Haut einwirkenden Druckreizes wiederholt. Er findet, dass bei normalen Personen die Abnahme der Empfindungsintensität sehr plötzlich eintritt. Die Zeit, die bis zum Entritt dieses "Empfindungssturzes" verstreicht, hängt in demselben Sinn wie die Gesamtumstimmungszeit (v. Frey) von der Reizstärke und der Grösse der Reizfläche ab. Mit dem Aufhören des Reizes tritt eine "Entlastungsempfindung" ein, ausserdem bleibt nach *längerer starker* Druckreizung eine Nachempfiundung zurück. Ist die Druckreizung *schwach* und *kurzdauernd,* so äussert sich die Nachwirkung darin, dass ein *unmittelbar* nachfolgender zweiter gleichstarker Reiz schwächer empfunden wird als als der erste. Nur wenn das Jntervallzwischen den beiden Reizen grösser als etwa 1–2 Sek. wird, wird das Verhältnis der beiden Reize objektiv richtig beurteilt. Eine Erklärung der in Rede stehenden Abschwächung aus einem "Aufmerksamkeitssprung" glaubt Verf. ablehnen zu können. Jn pathologischen Fällen findet man trotz Hypaesthesie die gleiche Beeinflussung der nachfolgenden Empfindung durch den voraufgegangenen Reiz, jedoch viel umfangreicher, weil hier die bewussten Nachempfindungen viel länger anhalten. Auf Grund interessanter Beobachtungen in einem Fall von operierter Rückenmarkgeschwulst mit Charcotschen Dysaesthesien stellt Verf. fest, dass infolge der abnormen Dauer der Nachempfindungen, je nach den Zeitverhältnissen, entweder das Fehlen der Perzeption von Sukzessivreizen oder eine mangelhafte Jntensitätsunterscheidung zur Beobachtung kommt.

Die gesamte Funktionsänderung ist *zentral* bedingt und kann das Zustandekommen komplexer Empfindungen (Stereognose) beeinträchtigen. TH. ZIEHEN (Halle a/S.).

274. FISCHER, W., Dass Erinnerungsvermögen an bestimmte Lagen im Raume und seine weitere Ausbildung durch Übung. *Zeit. f. Biol.*, 1923, **77**, 1–10.

Mit Hilfe des Gartenschen Neigungsstuhles wurde untersucht, mit welcher Genauigkeit eine Versuchsperson den eigenen Körper, unter Ausschluss des Gesichtssinnes, auf verschiedene Lagen im Raume einzustellen vermag. Bei dem gewöhnlichen horizontalen Sitz betrug der durchschnittliche Fehler nur etwa ½ Grad. Aber auch für beliebige andere Lagen, die nur einige Zeit eingeprägt wurden, ging der Fehler auf ähnlich kleine Werte herab. O. KLEMM (Leipzig).

275. KLEINKNECHT, F., Ein weiterer Beitrag zur Frage des Übungseinflusses und der Übungsfestigkeit am Neigungsstuhl. *Z. f. Biol.*, 1923, **77**, 11–28.

Aus den Beobachtungen an 60 verschiedenen Versuchspersonen, deren Anfangsleistung bei einer bestimmten Schieflage mit zwei anderweit geübten verglichen werden konnte, wird erkannt, dass die vorausgegangene Übung von vornherein auch die Genauigkeit der Einstellung auf die Schieflage begünstigt. Es gibt eine nachweisbare Übungsfestigkeit, auf Grund deren vor längerer Zeit geübte Lagen mit ziemlicher Sicherheit wiedergefunden werden. O. KLEMM (Leipzig).

276. JANET, P., L'Atonie et L'Asthenie Psychologiques. *Brit. J. of Med. Psychol.*, 1924, **4**, 1–11.

The words L'Atonie, L'Adynamie and L'Asthenie Psychologiques are used to designate particular forms of lessened activity which are produced through modification of either the psychological "tension" or the psychological "force." The proposed terms are defined and illustrated. The relation between psychological "tension" and psychological "force" is discussed as is also the relation of these concepts and the corresponding disorders to the concept of "mental energy." J. E. ANDERSON (Yale).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

277. Kitson, H. D., and Campbell, C., Seasonal Fluctuations in Frequency of Industrial Accidents. *J. Industr. Hygiene,* 1924, **5**, 408–409.

Records from six states over a period of four years show that the highest point in the accident curve is in July and August. D. A. Laird (Colgate).

278. Weaver, A. T., Experimental Studies in Vocal Expression. *J. of Applied Psychol.,* 1924, **8**, 23–51.

A review of some of the experimental studies is given. E. Mulhall Achilles (Columbia).

279. Böhmig, W., Massenpsychologisches aus katholischer Kirche und Sozialdemokratie. *Arch. f. Psychiat. u. Nervenkrankh.,* 1924, **70**, 109–128.

Verf. kommt unter anderem zu folgenden Schlüssen: Massenzusammenschlüsse grossen Stils erfolgen als Protestbewegungen gegenüber Entartungen des menschlichen Lebens. Die Vorarbeit, welche die Krisenstimmung über breitere Kreise ausbreiten und bis zu einem gewissen Schwellenwert steigern muss, wird meistems von Angehörigen höherer Bildungsgrade geleistet, denen dabei die Absicht einer Wirkung auf die Massen fernliegen kann. Der Verkünder der neuen Lehre kann erst auf diesem vorbereitetem Boden zur Wirkung kommen. Ders. Verf, macht in einem zweiten Aufsatz (S. 655–659) einige Bemerkungen zur Psychologie der Beichte. Th. Ziehen (Halle a/S.).

280. Lipmann, O., The Principles of Vocational Guidance (I). *Brit. J. of Psychol.,* 1924, **14**, 321–335.

Schemata are presented which exhibit the problems of guidance and selection; and a number of views are expressed regarding aims and procedure in vocational work. Among other points, emphasis is laid upon the artificiality of psychological testing conditions and the value of direct observation of spontaneous activity, especially in assessing temperament. Compared with selection, guidance is recognized as the more important problem. S. M. Newhall (Yale).

281. Burt, C., The Principles of Vocational Guidance (II). *Brit. J. of Psychol.*, 1924, **14**, 336–352.

Four practical problems of vocational guidance together with tentative solutions and suggestions are set forth. The problems are as follows: (1) the best age for giving guidance, (2) the body which should give the guidance, (3) the qualities demanded by particular occupations, and (4) the qualities in the individual which demand assessment. S. M. Newhall (Yale).

282. Thurstone, L. L., The Principles of Vocational Guidance (III). *Brit. J. of Psychol.*, 1924, **14**, 353–361.

Several terms pertaining to tests are defined and a list is given of 33 principles which are an outgrowth of the author's mental testing experience and which relate to the nature, construction, and use of vocational tests. S. M. Newhall (Yale).

283. Watt, H. J., Functions of the Size of Interval in the Songs of Schubert and of the Chippewa and Teton Sioux Indians. *Brit. J. of Psychol.*, 1924, **14**, 370–386.

A statistical analysis of 56 of the songs of Schubert and 183 songs of the Chippewa and Sioux Indians shows that the frequency with which any interval is used decreases as the interval increases in size. Apart from minor discrepancies, the ratio of decrease of frequency for each increase of an interval of a semitone is approximately 60 per cent. In the songs of Schubert and of the Indians an interval is used more frequently for descent, relatively to its use for ascent, the smaller it is—except the minor second. Similar statistics for similar and contrary motion show that an interval is used more often by contrary motion, the larger it is—except the minor second. J. E. Anderson (Yale).

8. SPECIAL MENTAL CONDITIONS

284. Yellowlees, D., The Practice of Psychoanalysis. *Glasgow Med. J.*, 1924, **19**, 198–213.

The author, who leans toward Jung, presents an analysis of a man who was uncomfortable in church to show how analysis works and how opposition to it sometimes develops in the laity. D. A. Laird (Colgate).

285. Anon., Analytic Psychology. *Brit. Med. J.*, 1924, No. 3307, 878–879; No. 3308, 929–930.

Summary of two lectures by Jung, giving his statement of belief. D. A. Laird (Colgate).

286. Galant, S., Das Halluzinationsproblem und die Algohallucinosis. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 187–215.

Verf. glaubt, dass die Halluzinationen "unbewusste sexuelle Wünsche sind, die auf symbolischen Weg sich realisieren." Durch den gewöhnlich die Halluzination begleitenden "Seelenschmerz" wird die Halluzination zu einer, "algolagnischen sexuellen Wunscherfüllung." Ausführliches, aber nicht vollständiges Literaturverzeichnis am Schluss und einleitende historische Bemerkungen zur Halluzinationslehre. Th. Ziehen (Halle a/S.).

287. Pawlow, I., "Innere Hemmung" der bedingten Reflexe und der Schlaf- ein und derselbe Prozess. *Skand. Arch. f. Physiol.*, 1923, **44**, 42–58.

Diese Theorie geht von der Grundtatsache aus, dass jeder mehr oder weniger lange andauernder Reiz, der auf einen bestimmten Punkt der Grosshirnrinde fällt, wenn er nicht gleichzeitig durch andere Reizungen begleitet oder wenigstens abgelöst wird, zur Schläfrigkeit und später zum Schlaf führt. Bald geht die Hemmung unmittelbar in Schlaf über, bald wird sie umgekehrt durch Schlaf vertreten, bald auch summieren sich Schlaf und Hemmung. O. Klemm (Leipzig).

288. Gertz, E., Untersuchung über die Reizschwellen des Coffeïns und Theobromins. *Skand. Arch. f. Physiol.*, 1923, **44**, 129–142.

Coffeïn und Theobromin kommen in unseren gebräuchlichen Genussmitteln Kaffee, Thee und Kakao vor. Das bedingte minimum perceptible für Coffeïn betrug in gewöhnlichem Wasser 0.006%, für Theobromin 0.004%. Das unbedingte Minimum lag etwas höher. Das minimum distingible fand sich für Coffeïn für eine Konzentration von 0.010% bei einer Reizdifferenz von 0.018%, während es für eine Konzentration von 0.02% auf 0.008% herabsank. O. Klemm (Leipzig).

289. Flügel, J. C., Critical Notice of "A Critical Examination of Psycho-Analysis" by A. Wohlgemuth. *Brit. J. of Med. Psychol.*, 1924, **4**, 50–58. J. E. Anderson (Yale).

290. Beverly, B. I., and Sherman, M., Postencephalic Behavior Disturbance Without Physical Signs. *Amer. J. Dis. Children*, 1924, **27**, 565–568.

Change to impulsive delinquencies, violent temper, and appearance of deterioration without low mental test performance may be result of organic brain disturbance in children though neurological signs are absent. D. A. Laird (Colgate).

291. Clark, G. E., Suggestion: An Important Factor in Mental Disease. *Arch. Occup. Therapy*, 1924, **3**, 199–203.

"In looking back over thirty years of general practice nothing stands out as being so completely satisfactory and lasting as the cures made by psychotherapeutic methods." The supplementation of psychoanalysis by suggestion is urged. D. A. Laird (Colgate).

292. Foss, H. L., and Jackson, J. A., The Relationship of Goiter to Mental Disorders. *Amer. J. Med. Sci.*, 1924, **158**, 724–735.

Comparison of general and state hospital patients shows goiter to be uncommon among the insane. D. A. Laird (Colgate).

293. Claude, H., and Brousseau, A., Nature of Dementia Praecox. *Bull Méd.*, 1924, **38**, 323–336.

Two types differentiated; one a simple, degenerative self-absorption, the other complicated by delusions, and hallucinations. D. A. Laird (Colgate).

294. Alpers, B. J., Campbell, C. J., and Prentiss, A. M., The Spinal Fluid Sugar. *Arch. Neurol. and Psychiat.*, 1924, **11**, 653–663.

A study of 421 spinal fluid sugar estimations in cases comprising various types of nervous and mental disease, and in presumably normal individuals. In epidemic encephalitis the sugar was found to show a marked increase over the normal; while other conditions also give a high sugar content, and the test is thus not pathognomonic, it should be of distinct diagnostic value. An increase was also found in dementia precox, where some of the sugar values found were fully

as high as were found in epidemic encephalitis, though here they were less frequent. Two cases of diabetes mellitus showed sugar content about two and three times the normal, respectively. Although several untreated general paresis cases showed an increase as high as in epidemic encephalitis, the group as a whole showed no increase; treated cases likewise averaged within normal limits, but lower than those that were untreated. The spinal fluid sugar in manic-depressive insanity was found to be normal. B. M. CASTNER (Boston Psychopathic Hospital).

295. BROCK, S., and WECHSLER, I. S., Involuntary Movements: Their Unusual Association and Relation to the Phenomena of Decerebrate Rigidity. *Arch. Neurol. and Psychiat.*, 1924, 11, 697–706.

The dyskinetic disorders which accompany or follow epidemic encephalitis present such unusual combinations and fragmentation of the involuntary movements as to render classification into definite clinical syndromes well-nigh impossible. Attention is directed to "(1) the various combinations of abnormal involuntary movements in the same patient; (2) manifestations of fragments of dyskinetic syndromes in others; (3) the differences of the same type of involuntary movements in different patients and in the same patient at different times; (4) the presence of phenomena hitherto unassociated with the more or less well-defined syndromes; and (5) the occurrence in definitely organic disease of movements which, because of their pattern-like character, have hitherto been regarded as psychogenic in nature." Cases are presented to illustrate these points, in one of which were observed phenomena showing clearly the pattern of decerebrate rigidity. The relation of such phenomena to the involuntary movements is considered, and decided exception taken to Walshe's recent statement that the phenomena are found only as the result of lesions of the pyramidal tract. The pathways actually involved are not clear, but "whatever the explanation, the fact remains that clinically one does observe phenomena showing *the pattern* of decerebrate rigidity in patients exhibiting abnormal involuntary movements and extrapyramidal syndromes. No one has conclusively shown that the *quality* of this extensor postural tonus pattern must be *the* specific hypertonus of pyramidal tract lesion." B. M. CASTNER (Boston Psychopathic Hospital).

296. Thom, D. A., The Relation Between Infantile Convulsions and the Chronic Convulsive Disorders of Later Life. *Arch. Neurol. and Psychiat.*, 1924, 11, 664–668.

A preliminary study to determine the relation between infantile convulsions and the chronic convulsive disorders of later life, and to ascertain which type of convulsion may be considered malignant, and which benign. Extensive studies made on 300 cases selected at random from the Monson State Hospital for Epileptics show that in 150 patients the first convulsion occurred before the fourth year. Out of a total of 1907 case records studied at the Massachusetts General, the Infants' and the Children's Hospitals, 111 patients were found to have had convulsions prior to the fourth year; of these, 62, or 56 per cent, belong to the malignant group—that is, have died, continue convulsions, or are mentally deficient—while only 44 per cent belong to the benign group. Combining his cases with those of Dr. Morse (*Archives of Neurology and Psychiatry,* December, 1923), out of a total of 218 patients suffering from infantile convulsions, 101 are definitely abnormal—"a fact which is sufficiently striking, and contrary to our present-day conception of infantile convulsions." M. S. Child (Boston Psychopathic Hospital).

297. Favill, D., and Rennick, C. F., A Case of Family Periodic Paralysis. *Arch. Neurol. and Psychiat.*, 1924, 11, 674–679.

A mild case of family periodic paralysis is presented, that one more record of a rather rare disease may go on file. There is no attempt at pathogenesis. A brief review of historical cases and theories is offered, and a diary record of treatment in the case reported. A. L. Gould (Boston Psychopathic Hospital).

298. Stein, L., Entwicklungsgeschichtliche Deutung der Entstehung des Silbenwiederholens. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, 70, 573–578.

Verfasser versucht eine Erklärung des klonischen Charakters des sogenannten Entwicklungsstotterns im 3.–8. Lebensjahr und bespricht einige Beziehungen zur normalen Verlegenheitssprachstörung. Th. Ziehen (Halle a/S.).

299. Lehmann, W., Über viscerale Analgesie bei Tabes. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, 70, 302–308.

Die Mitteilung ist im Hinblick auf das Schmerzproblem auch für die Normalpsychologie interessant. Verf. weist auf das Vorkommen

visceraler Analgesien (Augapfel, Trachea, Mamma, Ovarien, Hoden) bei Tabikern hin. Die Sensibilität der *Haut* kann dabei in allen Qualitäten intakt sein. Verf. glaubt, dass die visceralen Empfindungen auf afferenten *sympathischen* Bahnen durch die *vorderen* Rückenmarkswurzeln geleitet werden. TH. ZIEHEN (Halle a/S.).

300. HOEPFNER, T., Über assoziative Aphasie. *Arch. f. Psychiat. u. Nervenkrankh.*, 1924, **70**, 16–57.

Verf. versucht das Stottern als eine assoziative Aphasie zu deuten. TH. ZIEHEN (Halle a/S.).

301. QUENSEL u. PFEIFER, Über reine sensorische Amusie. *Z. f. d. ges. Neurol. u. Psychol.*, **81**, 311–330.

Bei einem Kriegsverletzten (Tangentialschuss mit Rinnenbruch des rechten Scheitelbeines und schwere Gehirnverletzung) fand sich nach Abheilung der akuten Symptome neben linksseitiger, peripherer, vollkommener Taubheit ein Defekt der zentralen Hörfähigkeit mit komplettem Ausfall der tiefen Töne. Infolge des Hördefekts wurden musikalische Klänge als ungeordnete Geräusche gehört und in unangenehmster Weise empfunden. Dabei war bei dem Kranken, der früher viel Musik betrieben hatte, das Klang- und Melodiengedächtnis erhalten. Aphasische Störungen fehlten. Es wird angenommen, dass durch die Schussverletzung eine doppelseitige Schädigung der zentralen Hörleitung bezw. des zentralen Projektionsfeldes für Töne erfolgt war, eine genauere Lokalisation war jedoch nicht möglich. W. MAYER-GROSS (Heidelberg).

362. MARCUS, Sensorische Paramusie. Ein Beitrag zur Lokalisation des Musiksinns. *Z. f. d. ges. Neurol. u. Psychol.*, **81**, 625–642.

M. berichtet über den Fall einer Gesanglehrerin, die etwa im 80. Lebensjahr ihre Fähigkeit für musikalisches Hören, besonders für Gesang, fast völlig eingebüsst hatte. Jeder Gesang erschien ihr falsch, sie ward immer unzufriedener auch mit den Leistungen ihrer besten Schülerinnen. Schliesslich stellten sich auch Zeichen einer senilen Geistesstörung ein, an welchen die Kranke schnell starb. Die Sektion ergab einen Herd im mittleren Drittel der ersten linken Temporalwindung, die Wernickesche Stelle war dagegen nicht zerstört. An diese Stelle und in dem entsprechenden Teil der

zweiten Temporalwindung lokalisiert der Autor unter vergleichender Heranziehung von Befunden anderer Autoren den "Musiksinn." Der Wert des Befundes wird beeinträchtigt durch den Umstand, dass eine genauere Prüfung des Gehörs und der musikalischen Fähigkeiten bei der Patientin nicht möglich war. W. MAYER-GROSS (Heidelberg).

303. SCHILDER, P., Zur Psychologie epileptischer Ausnahmezustände. *Z. f. d. ges. Neurol. u. Psychol.*, **81**, 174–180.

Aus einer eingehenden psychologischen Analyse von etwa 20 Dämmerzuständen, die jedoch im einzelnen nicht mitgeteilt sind, glaubt Sch. entnehmen zu können, dass inhaltlich in diesen Zuständen stets die Idee des Todes und die Wiedergeburt eine Rolle spiele. Daneben steigt Verdrängtes an die Oberfläche und findet seine Erfüllung oft ganz nach Art des hysterischen, wunscherfüllenden Delirs. Eine Auffassungsstörung ist nicht die Vorbedingung für das Durchbrechen solcher "primitiver" oder verdrängter Inhalte. Daneben soll auch die Auffassung des epileptischen Dämmerzustandes als Rückkehr zum "Narcissmus" möglich sein und so manche Ähnlichkeiten mit den schizophrenen Zuständen erklärt werden. Interessanter als diese Deutungen nach der Lehre *Freuds* sind Gedächtnisversuche, welche der Verfasser zur Frage der Amnesie nach den Dämmerzuständen angestellt hat. Er hat die Kranken in den Ausnahmezuständen kleine Gedichte auswendig lernen lassen, und ihnen Bilder gezeigt. Dabei konnte er in allen Fällen Spuren des Gelernten nachweisen: und zwar wurden entweder die gelernten Verse noch teilweise gewusst, oder es stellte sich beim Vorlesen und Vorzeigen nach dem Dämmerzustand ein "Bekanntheitsgefühl" ein, oder es ergab sich eine Erleichterung des Neulernens mit Hilfe des Ersparnisverfahrend. Protokolle sind nicht mitgeteilt. W. MAYER-GROSS (Heidelberg).

304. LEIRI, F., Über Tremor bei Kleinhirnaffektionen. *J. f. Psychol. u. Neurol.*, 1923, **29**, 429.

L. hatte Gelegenheit die Autopsie eines von *Fabritius* klinisch beobachteten 82 jährigen Schneiders zu machen, bei dem als hervorstechendes Symptom ein Wackeltremor und Intentionstremor der rechten Extremitäten und des Rumpfes (nicht des Kopfes) beobachtet worden war, der nach einem Insult ohne Bewusstseinsverlust auftrat. Es fand sich vor allem ein Erweichungsherd in der rechten

Kleinhirnhemisphäre, der den Nucleus dentatus und die umgebende Marksubstanz zerstört hatte. Auch der Nucleus emboliformis und die Nuclei globosi waren rechts zerstört, der Dachkern intact. Die sekundären Degenerationen bestrafen den Bindearm zum Nucleus ruber und Thalamus der linken Seite, daneben den rechten Brückenarm, die linke Oliva inferior und die olivozerebellaren Oblongata-Fasern. Eine Degeneration der linken Schleife konnte wohl auf eine der zahlreichen arteriosklerotischen Gewebstücken, "Lakunen" zurückgeführt werden, die sich in fast allen Hirnteilen zerstreut fanden ("Etat de désintégration" *Pierre Marie*). *Leiri* führt den Tremor auf die Zerstörung des Nucleus dentatus und der umgebenden Marksubstanz zurück, in der neben efferenten Cerebellarfasern viele cortico—cerebellar Bahnen convergieren, in ähnlicher weise wie in der innern Kapsel des Grosshirns (*Bárány*). L. glaubt, dass der Tremor durch die corticalen Korrektionsversuche ausgelöst wird, die der cerebellaren Dysmetrie und Hypermetrie entegegenwirken. Den Umstand, dass die Kopfbewegungen frei von Tremor waren, führt L. auf die Unversehrtheit des Dachkerns zurück. In einem zweiten gleichfalls von *Fabritius* beobachteten Falle mit Intentionstremor der rechten Extremitäten fand sich ein Tumor, der hauptsächlich den rechten Bindearm betraf. E. Wallenberg (Danzig).

305. Borchardt, L., Die thyreosexuelle Insufficienz, eine besondere Form der multiplen Blutdrüsensclerose. *Deutsches Arch. f. klin. Med.*, 1923, **143**, 35.

Die thyreosexuelle Insufficienz wird als Symptomencomplex beschrieben, der eine gleichzeitige Erkrankung der Schilddrüse und der Keimdrüsen darstellt. Sie tritt in den Zeiten der Pubertät, des Puerperiums und des Climacteriums auf, nimmt häufiger von den Keimdrüsen als von der Glandula thyreoidea ihren Ausgang Die Erkrankung bevorzugt Frauen, nur in der Pubertätszeit werden in gleicher Zahl männliche und weibliche Patienten befallen. Die Krankheit hat 3 Erscheinungsformen: 1. als Myxödem, 2. als Fettsucht, 3. als Sclerodermie mit Genitalatrophie. Prognose quoad vitam ist günstig. Auf Grund der gleichen anatomischen Vorgänge (: bindegewebliche Vorgänge in den erkrankten Drüsen) die sie bei der thyreo-testiculo-hypnophyseo-suprarenalen Insufficienz auftreten, betrachtet der Autor die thyreosexuelle Insufficienz als eine besondere Form der multiplen Blutdrüsensclerose. W. Riese (Frankfurt a/M.).

306. Eisler, E. R., The Religious Factor in Mental Disorder. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 85–95.

"The characteristic religious coloring which, so frequently, is manifested in the delusions of psychotic patients, is conditioned, largely, by unconscious emotional conflicts, many of which would appear to have originated through association of instinctive trends with the inhibitive force of traditional faith. The specific 'religious' behavior of abnormal individuals, involving conversion symptoms, convulsions, criminal assaults, hysterical states, etc., as well as the so-called normal reactions of individuals alleging 'religious experiences,' manifested by piety, fervor, and ecstasy, is dependent, in part at least, upon such mental mechanisms as rationalization, compensation, conversion, and compromise." M. S. Child (Boston Psychopathic Hospital).

307. Ahlswede, E. H., Nonspecific Stimulation Therapy in Tabes Dorsalis. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 80–83.

"The therapy of tabes dorsalis depends essentially on a careful balance between specific and nonspecific measures, while particular stress must be laid on an extreme exploitation of the defensive reactivity of the body in general. Nonspecific protein stimulation is indicated previous to all specific measures. The biologic reaction of the patient (blood picture, sinking velocity of the red cells) requires regular control to ascertain when the maximum stimulation has been attained and to avoid 'proteinogenous tiring.' For antisyphilitic therapy, bismuth compounds (oxibenzoic acid compound of bismuth) and organic iodin compounds are particularly indicated on account of their additional nonspecific coefficient." B. M. Castner (Boston Psychopathic Hospital).

308. Timme, W., The So-called Unit Characters in Relation to Hereditary Disturbances of the Nervous System. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 131–136.

Disease processes are not unit processes with well-defined boundaries, and any study dealing with their heredity and transmissibility must be based on a consideration of their basic unit factors instead of on the finished disease process as we see it. It is necessary also "to determine not merely the existence in ascendant or descendant of the similar set of symptoms connoted by (the) disease in the patient, but further, to consider the possibility of frequently

recurring constitutional anomalies in the family studied as having some bearing on the pathogenesis of the disease in question and perhaps even of such an anomaly concealing one of the true unit factors of the disease." B. M. CASTNER (Boston Psychopathic Hospital).

309. WILMER, W. H., Hereditary Factors Responsible for Development of Optic Atrophy and Retinitis Pigmentosa. *Arch. of Neurol. and Psychiat.*, 1924, 12, 137–148.

The inheritance of tissue vulnerability, making the optic nerve fibers especially susceptible to extraneous conditions and poisons, is an interesting feature of both Leber's disease and pigmentary degeneration of the retina. The author's studies do not bear out the common statement that consanguinity is an important factor. B. M. CASTNER (Boston Psychopathic Hospital).

310. CUTLER, G. D., End Results in Sixty-Two Cases of Spina Bifida and Cephalocele. *Arch. of Neurol. and Psychiat.*, 1924, 12, 149–166. B. M. CASTNER (Boston Psychopathic Hospital).

311. CLARKE, N. E., Loculated Meningitis with the Syndrome of Froin in the Spinal Fluid. *Arch. of Neurol. and Psychiat.*, 1924, 12, 173–186.

Several cases showing the syndrome of Froin in the spinal fluid were of probable of proved syphlitic origin. In one case of loculated meningitis a diagnosis of syphilis was definitely confirmed by the demonstration of *Spirocheta pallida* in the spinal tissues. B. M. CASTNER (Boston Psychopathic Hospital).

312. WINKELMAN, N. W., and ECKEL, J. L., Pathology and Pathogenesis of Unilateral Internal Hydrocephalus: Report of a Case. *Arch. of Neurol. and Psychiat.*, 1924, 12, 187–196.

From a clinical standpoint diagnosis of unilateral hydrocephalus is uncertain. It may occur from obstruction at the foramen of Monro, or as the result of brain changes due to arteriosclerosis or encephalitis, while partial unilateral hydrocephalus occurs as a result of localized vascular or encephalitic changes resulting in what Weber calls hydrocephalus ex vacuo. B. M. CASTNER (Boston Psychopathic Hospital).

313. Hubbard, L. D., A Comparative Study of Syphilis in Colored and in White Women with Mental Disorder. *Arch. of Neurol. and Psychiat.*, 1924, **12**, 198–204.

Based upon records of the Government Hospital for the Insane, over a period of seven years. Of the female admissions during that time, about three times as many syphilitics, proportionately, were found among the colored patients as among the white. Among the syphilitics, about the same proportion for each race showed involvement of the central nervous system. The general trend of the percentage of syphilitic admissions has been downward. B. M. Castner (Boston Psychopathic Hospital).

10. INDIVIDUAL, RACIAL AND SOCIAL PSYCHOLOGY

314. Riddell, W. R., A Case of Supposed Sadism. *J. Crim. Law and Crim.*, 1924, **15**, 32–41.

A detailed account of so-called sadistic murder at the hands of an alcoholic, subnormal paretic. M. S. Child (Boston Psychopathic Hospital).

315. McCord, C. P., A Survey of the Albany County Jail and Penitentiary from the Social, Physical and Psychiatric Viewpoints. *J. Crim. Law and Crim.*, 1924, **15**, 42–67.

One hundred and twelve inmates of the Albany County Jail and the Albany Penitentiary were thoroughly examined by the writer socially, physically, and psychiatrically. The prisoners were housed in an antiquated, seventy-four-year-old building in which decent, hygienic standards of living are maintained with difficulty. There was no classification of prisoners according to law. There was segregation of prisoners with active gonorrheal infection, and no definite treatment of these cases was observed. There was no adequate provision for exercise or recreation. Of the 112 prisoners examined only 18 were free from physical disease or defect; 12 were feebleminded, 3 were psychotic, and "26 others were of such low-grade intelligence and inadequate personality and early in their lives showed such industrial inefficiency that failure for this entire group of 41, or approximately 37 per cent, could have been prognosticated." One hundred and eight acknowledged sex promiscuity, and of these 7 had active gonorrhea and 17 had had syphilitic infection with only

desultory treatment. Inasmuch as 40 per cent of criminals are repeaters, and inasmuch as these 112 prisoners had had collectively 434 arrests, trials, and trips to the jail, all at public expense, the introduction of modern psychiatric methods of handling the situation would greatly curtail state expenditure and increase efficiency. The writer recommends the construction of a modern jail; the classification of prisoners according to law; complete physical examinations, including the Wassermann reaction; segregation and treatment of venereal cases; neuropsychiatric consultation, with prompt transfer to state hospitals or institutions of recommended cases; and the introduction of "follow-up" social service. M. S. CHILD (Boston Psychopathic Hospital).

316. GOSLINE, H. I., From Pathology to Criminology. A Study in Abnormal Psychology and Eugenics. *J. Crim. Law and Crim.*, 1924, **15**, 68–146.

Enunciation of a new, speculative philosophy of pathology, extended to include disorders not only in the physical realm, but in the mental and social. The traditional, definitive gaps are bridged by a basic similarity founded on "disorders of force and of order." M. S. CHILD (Boston Psychopathic Hospital).

317. MENKEN, A. D., The Rehabilitation of the Morally Handicapped. A Study in Social Service. *J. Crim. Law and Crim.*, 1924, **15**, 147–154.

A study of the readjustments of three hundred Jewish women convicted in the Women's Court in New York City and parolled to the Jewish Board of Guardians. There is ample evidence of the success of follow-up social service and supervision. M. S. CHILD (Boston Psychopathic Hospital).

318. SPECTOR, T., The Influence of Journalism on Crime. *J. Crim. Law and Crim.*, 1924, **15**, 155–158.

A discussion of the evil effects of contemporary journalism on suggestible individuals and on children. It is recommended that the press be regulated by more rigorous state laws. M. S. CHILD (Boston Psychopathic Hospital).

319. PORTEUS, S. D., Temperament and Mentality in Maturity, Sex and Race. *J. of Applied Psychol.*, 1924, **8**, 57–74.

The sex differences which Porteus gives do not agree with the results of some other investigators. Through the coöperation of the

University of Hawaii and the Vineland (N. J.) Laboratory studies on racial differences will be made. E. MULHALL ACHILLES (Columbia).

320. MOORREESS, V., Immediate Heredity of Primary Aments Committed to a Public Institution. *J. of Applied Psychol.*, 1924, **8**, 89–127.

Of the 45 cases studied 33 or 73.3 per cent have one or both parents who are themselves below the borderline. Of these mentally defective parents, 30 were mothers, 13 fathers, and 11 cases both father and mother were defective. The fathers form a group relatively low in intelligence for their occupational status. E. MULHALL ACHILLES (Columbia).

321. ORTH, H., Zum Erbgang der konstitutionellen Taubstummheit. *Arch. f. Ohren-Nasen- u. Kehlkopfheilkd.*, 1924, 11, 84–101.

Wendet die Ergebnisse der Mendel'schen Vererbungstheorie auf die Vererbungserscheinungen bei der konstitutionellen Taubstummheit an, und findet aus der Vergleichung zahlreicher Stammbäume, dass ein "dominanter" Typus (Vorkommen merkmaltragender Kinder bei merkmalbehaftetem einem Elter) nicht in Frage kommen kann, sondern ein "rezessiver" Typus Hervorgehen kranker Kinder aus Ehen gesunder Eltern). O. KLEMM (Leipzig).

322. BORCHARDT, L., Neuere Ergenbnisse der Konstitutionsforschung. *Internat. Zent. f. Ohrenheild. u. Rhino-Laryngol.*, 1924, 22, 189–208.

Die klinische Konstitutionslehre beschäftigt sich mit der Erforschung des Wesens der Individualität: es ist ihre Aufgabe, die gesetzmässigen Grundlagen individueller Unterschiede zu ergründen. Die wichtigste Grundlage für jede solche Konstitutionsanalyse ist heute die Analyse des Erbganges. Es folgt eine Übersicht über die wichtigsten Konstitutionstypen, die zur Zeit bekannt sind. O. KLEMM (Leipzig).

323. ADLER, A., Fortschritte Der Individualpsychologie. *Brit. J. of Med. Psychol.*, 1924, **4**, 12–21; English translation, 22–31.

Every individual acts and suffers in accordance with his peculiar teleology. Its springs may be traced to his earliest childhood. Nearly

always there is diversion into false channels by the pressure of physical and mental difficulties. The neuroses and psychoses are modes of expression for human beings who have lost courage. There is no need for undertaking with such persons tedious excursions into the mysterious regions of the psyche. The best method of treatment removes the true causes of the discouragement. Mental phenomena when correctly understood may be regarded as leading up to an end which consists in establishing the subject's superiority. It is the task of education to prevent the mind from receiving the stamp of this striving after power and to promote the development of the innate social feeling. The treatment of neurotics consists in revealing their mistakes, demolishing their striving after power, and raising their social feeling. J. E. Anderson (Yale).

324. Baynes, H. G., Primitive Mentality and the Unconscious. *Brit. J. of Med. Psychol.*, 1924, **4**, 32–49.

This paper is based on two postulates: (a) That the myth, as the psychological currency of the prelogical psyche can be fully understood only by an intuitional or prelogical attitude; (b) the mythological formations being adaptation survivals, gradually elaborated by the psyche through countless ages, are an invaluable guide in the shaping of our instinctual attitude to experience. We are concerned with man, not as a more or less isolated unit, moved by typical mechanisms, but as an individual leaf of the tree of life; a leaf whose real nature cannot be understood until it is also viewed as a function of the whole. General psychological concepts which can embrace the totality of the individual with the infinite range and complexity of his ancestral and impersonal determinants have still largely to be made. A purely intellectual or analytical approach, which can only see life piecemeal, is obviously incompetent to perform this task. We shall never possess a psychology worthy of the dignity of man, until we are able to confer upon our intuitional conclusions the same authority that we give to our rational deductions. J. E. Anderson (Yale).

325. Cleeton, G. C., and Knight, F. B., Validity of Character Judgments Based on External Criteria. *J. of Applied Psychol.*, 1924, **8**, 215–231.

The study was undertaken to supply statistical basis for the truth or falsity of the theory and practice of character analysis.

Some of the conclusions are: (1) The ratings of close associates are reliable. (2) The physical factors purporting to measure the same trait do not present even a suspicion of agreement. (3) The correlation between ratings of casual observers and physical measurements is best represented by 0.000. (4) The correlation between close associates and physical measurements is best represented by 0.000. (5) Physical measurements which underlie character analysis agree neither with themselves nor with other measures of character. E. MULHALL ACHILLES (Columbia).

326. FRANKEN, R. B., Advertising Appeals Selected by the Method of Direct Impression. *J. of Applied Psychol.*, 1924, **8**, 232–244.

Several hundred men and women were asked to rate hosiery advertisements on a four-point scale. Future studies will show whether this method of direct impression will supplant the order of merit method. The latter cannot be used for large numbers of items. E. MULHALL ACHILLES (Columbia).

327. ELLWOOD, C. A., The Relations of Sociology and Social Psychology. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 3–12.

A broad analysis discloses that social life is an "interdependence of the whole life process" differing from the group life of animals and plants by the introduction of psychic or conscious interdependence and interstimulation. Without an awareness of other individuals human social adjustments cannot take place. The distinction between social psychology and sociology is one of problems: "psychology . . . studies the individual and his behavior, while sociology studies the group and its behavior." The relationship is reciprocal, for psychology turns to group life for an explanation of social life on the part of the individual, sociology turns to psychology for a study of the individuals composing the group. M. S. CHILD (Boston Psychopathic Hospital).

328. MCDOUGALL, W., Can Sociology and Social Psychology Dispense with Instincts? *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 13–41.

The author examines in turn the arguments of Professors Dewey, Dunlap, Giddings and Josey and finds all of those conflicting in

any way with his own hormic theories fallacious and untenable. He reiterates the soundness of his views put forth previously in *Social Psychology* and in *Outlines of Psychology*. M. S. CHILD (Boston Psychopathic Hospital).

329. BERNARD, L. L., Discussion of Professor McDougall's Paper. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 42–45.

Although McDougall is correct in assailing Dewey's reversed view of instincts, he is wrong in substituting a native equipment comprising 7 or 12 or 13 instincts. Further and more detailed analysis of the nodulation of experience termed instincts or desires is necessary before instinctive behavior can be understood. M. S. CHILD (Boston Psychopathic Hospital).

330. KANTOR, J. B., The Institutional Foundation of a Scientific Social Psychology. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 46-56.

Social psychology is a science which can be adequately handled without postulating an animistic theory of instincts. Complicated social behavior is explicable in the same terms as an individual's reaction to the simplest situation, that is, in terms of stimulus and response. Stimuli and responses may be cultural or noncultural in character. A cultural stimulus is an institution, and an institution is "a common stimulus . . . any object or situation the contact with which results in the building up and later operation of conventional and conformity responses." Noncultural stimuli are common stimuli resulting in purely personal modes of conduct or experience. The stimuli differ in complexity, the responses in function. Institutions are numerous, differ with communities, and occasionally overlap. They originate "through the development of newer forms of actions than have previously existed in any particular community." M. S. CHILD (Boston Psychopathic Hospital).

331. OGBURN, W. F., Discussion of Professor McDougall's and Professor Kantor's Papers. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 57–59.

Before confusion can be overcome two distinct problems must be settled: the nature of instinct as a part of the inherited psychological equipment; and the relation of instinct to culture. To the sociologist it matters little what terms are used, which theories are correct, but

he is interested in the modifiability of native equipment and in the relative strength of native equipment and an established culture in reacting on each other to produce a civilization. M. S. CHILD (Boston Psychopathic Hospital).

332. ALLPORT, F. L., The Group Fallacy in Relation to Social Science. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 60–73.

Social behavior is motivated solely by the social reactions of the individual, not as has been variously assumed since the writings of Plato, by the operation of a group or social mind independent of the individual consciousnesses contained in the group. Recently Sageret, Sidis, Trotter, and in part, McDougall have argued for such a hypothesis. In addition to the overt collective mind theories, other more subtle, dynamic sociological theories rest on this assumption, such for instance, as Rivers' psychoanalytic interpretation of group conflicts, Ellwood's theory of revolutions and Kroeber's cultural superorganic theory. All are fallacious in so far as they rely on the group mind hypothesis. In the hierarchy of the sciences description precedes explanation: the description of a lower science furnishes the explanation for a higher. Psychology and sociology both observe social behavior, but with this distinction: social psychology furnishes the description of individual reactions, sociology uses this description to explain group behavior. M. S. CHILD (Boston Psychopathic Hospital).

333. GOLDENWEISER, A., Discussion of Professor Allport's Paper. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 74–76.

In criticism of Professor Allport's paper, the writer states that (1) not all organic theories of society are identified with the notion of a "social psyche"; (2) "at the present time no sociologist or social psychologist . . . entertains the theory of a social psyche except in a purely functional sense"; (3) it is unjustifiable to regard the individual as the only cause of historic change; (4) the distinction between description and explanation and its application to social psychology and to sociology is unjustifiable: explanation is "conceptualized description" and can be made within the same plane without further transformation. Such an approach is equally justifiable theoretically and avoids the tendency towards a scientific monism. M. S. CHILD (Boston Psychopathic Hospital).

334. Cason, H., Gregariousness as a Common Habit. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 96–105.

In support of his thesis that gregariousness is not an instinct, but is an individually acquired tendency, learned experiencially through the habitual repetition and association of pleasurable, human stimuli, the writer uses arguments from child psychology, pathology, and social behavior. By making habit responsible for all the multifold phases of gregariousness, he considers not only that he has produced a thoroughly adequate explanation, but one which meets the modern tendency to decrease or possibly to destroy all "instincts." M. S. Child (Boston Psychopathic Hospital).

11. MENTAL DEVELOPMENT IN MAN

335. Thompson, J., On the Symptoms and Home Treatment of Mentally Defective Infants and Young Children. *Edinburgh Med. J.*, 1924, **31**, 285–306.

A review of symptoms and classifications of mental defect, with treatment in infancy by checking bad habits, encouraging speech, and developing proper habits outlined. D. A. Laird (Colgate).

336. Friedjung, J. K., Environmental Types of Preadolescence, *Zeit. f. Kinderheilk.*, 1924, **37**, 125–144.

Discusses the unloved child, only child, child jealous of brother or sister, and child disturbed by parental quarrels. D. A. Laird (Colgate).

337. Bingham, W. V., and Davis, W. T., Intelligence Test Scores and Business Success. *J. of Applied Psychol.*, 1924, **8**, 1–22.

One hundred and two business men attending the Babson Statistical Conference at Wellesley Hills took the Bureau of Personnel Research Test VI. The correlation of the years spent in school and the test score was .44. The questions arose: Does outstanding success in business depend primarily on intelligence? To what extent may it be assumed that the brighter a man is, the farther he will go on the road toward business achievement? Do brains count for more than character and personality? Most of the men who served as subjects in this study were far above the average American in general intelligence. Within this selected group, success in busi-

ness, as estimated from items on a personal history record, does not correlate with intelligence as measured by a 15-minute group test. Better criteria of success are required, as well as more severe and thorough intelligence examinations in order to measure with accuracy the share which mental alertness contributes to accomplishment in business. But the evidence in hand suggests that superiority in intelligence above a certain minimum contributes relatively less to business success than does superiority in several nonintellectual traits of personality. E. MULHALL ACHILLES (Columbia).

338. CHASSELL, L. M., Three Children of Superior Intelligence and Inferior Motor Achievement. *J. of Applied Psychol.*, 1924, **8**, 128–139.

A careful study of three children was made and reported in detail. E. MULHALL ACHILLES (Columbia).

339. HERSKOVITS, M. J., A Test of the Downey Will-Temperament Test. *J. of Applied Psychol.*, 1924, **8**, 75–88.

It is believed that great caution should be exercised in the use of the Downey Test. E. MULHALL ACHILLES (Columbia).

340. MORGAN, J. J. B., A Mental Profile from an Omnibus Group Test. *J. of Applied Psychol.*, 1924, **8**, 52–56.

One disadvantage of the omnibus test has been that different performances are combined in such a way that the total score tells nothing as to any particular outstanding ability or lack. An attempt has been made to overcome this difficulty. E. MULHALL ACHILLES (Columbia).

341. LEVY, D. M., A Method of Determining the Mental Age During a Physical Examination. *Arch. Neurol. and Psychiat.*, 1924, **11**, 669–673.

An attempt has been made to devise and standardize a group of mental tests which can be incorporated into a physical examination, and thus provide a somewhat more accurate method of sizing up a patient's intelligence than is possible through mere impression of uncontrolled gestures and responses. Types of observation were classified in eight groups, but when compared with findings of the psychiatrist, mental tester, and the social historian, correlation varied from high to low. One group is reported in detail, with full instruc-

tions and directions for scoring. These are given during the physical examination, and comprise "a standardized form of directions for the finger-to-nose, finger-to-finger, and knee-to-heel coördination, spreading out fingers of both hands, and reading the letters from the visual chart with a card placed over one eye." Such a series should be of value in cases resisting the more elaborate mental test series, the psychotics, and egocentric psychopaths. The device is certainly superior to a haphazard judgment based on scattered responses in a physical examination. It does not pretend to displace the formal mental examination. A. L. Gould (Boston Psychopathic Hospital).

342. Davenport, F. I., Adolescent Interests. *Arch. of Psychol.*, 1923, **66**, pp. 62.

The aim of this study was to investigate the trends of sexual interest and status of sexual knowledge of young women in their adolescence. The data were 880 spontaneous questions asked in writing by 160 young women in a city training school for teachers. The summary points out the possible comparison of the amount of interest shown in primitive sexuality with the amount shown in the acquired and socially acceptable sentiments, ideals, and institutions of love, conventional companionship, marriage and parenthood. It shows the comparatively large amount of inquiry concerning congenital conditions and reproduction. There were also many inquiries concerning physical welfare. E. Mulhall Achilles (Columbia).

343. Dawson, S., Variations in the Mental Efficiency of Children During School Hours. *Brit. J. of Psychol.*, 1924, **14**, 362–369.

Mental efficiency is measured by 10-minute performances in arithmetic multiplications which come at intervals of one hour throughout the school day, *i.e.*, from 9:30 to 3:30. The procedure is such as to largely eliminate practice effect. The 1,200 school children used ranged in age from nine to fourteen. No significant differences appear in the mean outputs for all the 10-minute periods except those occurring at 10:30 and 3:30, when there are significant increases. The 10:30 rise appears due to "habit attitude" or set favoring arithmetic performance at that time because that happens to be the usual hour for the arithmetic lesson. The 3:30 rise is shown to be partially at least a practice effect which the arrangement of the experiment did not eliminate. On the whole, mental efficiency,

as measured, remains at an approximately constant level throughout the school day. S. M. NEWHALL (Yale).

344. WILSON, W. R., WELSH, G., and GULLIKEN, H., An Evaluation of Some Information Questions. *J. of Applied Psychol.*, 1924, **8**, 206–214.

An attempt to evaluate information questions was made and the following conclusions drawn: (1) The empirical method should be extended to include each element in an information test. (2) It is impossible to determine with accuracy the value of an information question alone. (3) The stability of difficulty and distributing value of information questions is sufficiently large so that questions can be evaluated one year for use the next. E. MULHALL ACHILLES (Columbia).

345. WEAVER, A. T., Experimental Studies in Vocal Expression. *J. of Applied Psychol.*, 1924, **8**, 159–186.

Vocal expression can be measured by only one standard, viz, its effect upon listeners. The subjects were 210 young men from ten different sections of the course in "The Elements of Public Speaking" at the University of Wisconsin. The material was Austin Dobson's poem "Tu Quoque." As each subject read the assigned selection he was judged by every other student in his group, being given a *percentage grade on vocal expressiveness.* An attempt to select a battery of tests which should show significant correlations with the criterion was made. For *general intelligence* Terman's revision of the Binet-Simon word list was used, for *audition* Seashore's group measures of musical talent were used, thus making possible group measurements of pitch, sense of intensity, sense of time sense of consonance, and tonal memory. The battery of aptitude tests correlates to the extent of +.52 with the criterion. E. MULHALL ACHILLES (Columbia).

346. GIESE, F., Über Pauschalprüfungen bei Intelligenzuntersuchungen. *Z. f. päd. Psychol.*, 1924, **25**, 137–139.

Unter Pauschalprüfungen werden Testverfahren verstanden, die aus einer additiven Zusammenstellung zweckentsprechender Einzelproben bestehen, die eine rasche grundsätzliche Erkenntnis geistiger Veranlagungen einer Prüflingsmasse bezwecken und daher nicht zur einzelnen Auswertung, sindern zu summarischer Feststellung gelöster

Aufgaben in einer festbegrenzten Zeit gelangen (Beispiel: Die amerikanische Heeresprüfung). Im Anschluss an die kritische Besprechung eines in Spanien ausgearbeiteten Verfahrens werden praktische Richtlinien für eine wirksame Durchführung von Pauschalprüfungen unterbreitet. H. Bogen (Berlin).

347. Holt, M., Meranski, S., and Snell, J., Under the Direction of Amy Hewes, Mental Age and School Attainment of 1,007 Retarded Children in Massachusetts. *J. of Educ. Psychol.*, 1924, **15**, 297–301.

In accordance with an act of the Massachusetts legislature (Mass. General Acts, chapter 277, July 1, 1919), "the school committee of each city and town in which there are ten or more children three years or more retarded shall establish special classes to give such children instruction adapted to their mental attainments." This is mentioned to show the lead that state has taken in child training. The above committee, although it does not mention it is doing work in an official capacity, nevertheless should have its work encouraged so that it can supplement this investigation to cast further light on hitherto obscure and very much misunderstood problems. What is the correlation between mental age level and educational proficiency as obtained by examination? The coefficients are high, ranging from .82 in language to .59 in geography. The important factor is the considerable variation among school subjects as studied by these retarded children. For example, more than 60 per cent of them failed to make the grade in spelling corresponding to their mental age, while over 50 per cent were above the grade in writing. Where should the greater teaching stress be placed to be of most benefit to all concerned? G. M. Michaels (Columbia University).

348. West, P. S., The Significance of Weighted Scores. *J. of Educ. Psychol.*, 1924, **15**, 302–308.

Whether tests should be weighted depends entirely on the material used, and then we are not positive of the validity of such a procedure. Very often tests are weighted without validity. It is possible that weighting while not needed in one type of test is necessary in another. To test this controversy, two tests of a similar nature, each consisting of five parts, were used. They included the ability to reproduce the thought in passages read aloud by the examiner. One test was graded

by the possible credit obtainable on each of the five parts (74 points). The other was weighted to reach a total of 100. The correlation between the parts of both tests never went below .991 and was as high as .998. This particular survey would give reliable results in either case without affecting the standing of anyone in the group. As a check the Army Alpha test. The raw and weighted scores are a little more marked in certain instances. Some show justification for weighting, while many indicate closè agreement. Which are more reliable? No method can show this. Witness what Yerkes has to say on the subject: ". . . Our original use of the sum of unweighted scores in all tests as the definition of the combined scale for the measurement of intelligence is not in error for all practical purposes in so far as the internal evidence of the system is relevant." (*Mem. Nat. Acad.*, 15, 651.) G. M. MICHAELS (Columbia University).

349. WILSON, W. R., Information as a Measure of Intelligence, and Maturity. *J. of Educ. Psychol.*, 1924, 15, 309–312.

Ability to handle certain tests increases with the increase in the age of those tested. What part of the increase in ability is due to matured intelligence, and what part is due to greater experience? This of course is not known. An attempt is made here to lead to its solution by the use of the Alpha Test, part 8, where a good score is contingent upon experience rather than native ability. A high school group and a college group were tested for this purpose. The results show that the information test is subject to the same influences, and to the same degree as the other tests in Alpha. Chronological age and school grade have no effect on the general information test. Information tests correlate high with other measures of intelligence and have made them valuable members of such tests. They do not differ from intelligence tests and can be used to measure concomitant factors. G. M. MICHAELS (Columbia University).

350. PLENZKE, O. H., A Study of the Abilities of Vocational-School Pupils. *J. of Educ. Res.*, 1924, 10, 42–48.

The pupils in vocational continuation schools proved to be relatively deficient in reading and arithmetic as well as in general ability. S. W. FERNBERGER (Pennsylvania).

351. Mott, F., The Psychology of Adolescence. *J. of Ment. Sci.*, 1924, **70**, 190–208.

Notes on the psychology of adolescence, with frequent references to adolescents in literature. Certain differences which may be observed in the characteristic course of the development of adolescence in the male and female are emphasized. A. M. Jones (Pennsylvania).

12. MENTAL EVOLUTION

352. Mast, S. O., and Dolley, W. L., The Effect of Luminous Intensity on the Relation between Stimulating Efficiency and Flash-frequency of Intermittent Light in the Drone Fly, *Eristalis Tenax*. *Amer. J. Physiol.*, 1924, **63**, 285–293.

An experimental study which furnishes further evidence that when the receptors of this insect are exposed to continuous illumination, the light does not stimulate them continuously, but in rapidly alternating stimulating and refractory periods. M. J. Zigler (Princeton).

353. Slonaker, J. R., The Effect of Pubescence, Oestruation and Menopause on the Voluntary Activity in the Albino Rat. *Amer. J. Physiol.*, 1924, **68**, 294–315.

Throughout their sexual life female rats show marked rhythmic increases in voluntary activity. These cycles, occurring roughly every four days, are most marked at the cornified cell stage of oestruation and appear more regularly and to a more marked extent in younger sexually mature females than in older individuals. Prior to pubescence and subsequent to menopause these rhythmic fluctuations in voluntary activity do not occur. Male rats show no such regular rhythmic cycles in activity. M. J. Zigler (Princeton).

354. Stone, C. P., The Awakening of Copulatory Ability in the Male Albino Rat. *Amer. J. Physiol.*, 1924, **68**, 407–424. M. J. Zigler (Princeton).

355. Jungmann, P., and Bernhardt, H., Regulation of Osmosis, *Zeit. f. klin. Med.*, 1923, **99**, 84–101.

Inhibition of growth of tadpoles by thyroxin was counteracted and reversed by calcium ions, while potassium enhanced growth under

similar conditions. Both ions produced similar responses in the action of thymus. Investigators believe the action of autocoids is regulated largely by changing the constellation of electrolytes on the cell membrane in the vegetative nervous system. D. A. Laird (Colgate).

356. Parsons, H. T., and Alexander, N., A New Feeding Device for Use with the Experimental Rat. *J. Lab. and Clin. Med.*, 1924, **9**, 576–580.

Application of a screen cover to prevent wastage is described. D. A. Laird (Colgate).

357. Schiemenz, F., Ueber den Farbensinn der Fische. *Z. f. vergl. Physiol.*, 1924, **1**, 175–220.

Die alte Streitfrage um das Farbenunterscheidungsvermögen scheint nun endgültig zu Gunsten der Auffassung v. Frisch's entschieden zu sein. Schiemenz experimentierte mit Stichlingen (Gasterosteus aculeatus) und Ellritzen (Phoxinus laevis). Seine Hauptmethode bestand darin, dass den Fischen das Futter mit einem Stabe gereicht wurde, der durch Beleuchtung mit einem Spektralapparat Färbung erhielt. Die Fische reagierten deutlich auf die jeweilige Dressurfarbe, selbst bei sehr abgeschwächter Intensität. Violett vermochten die Fische sogar noch zu erkennen, wenn der Beobachter keine Färbung mehr sah. Daraus konnte auf Farbensinn für ultraviolette Strahlen geschlossen werden, was durch Versuche mit dem ganzen Spektrum bestätigt wurde. Dagegen zeigte sich für die Versuchstiere keine Verkürzung des Spektrums im langwelligen Teil. Es wurde festgestellt, dass die Ellritze Rot, Gelb, Grün, Blau, Violett, Ultraviolett bis 365 $\mu\mu$ Wellenlänge und Weiss unterscheiden kann. Die im Spektrum benachbarten Farben werden leicht verwechselt. Bei der Ellritze spielt die Farbe als Sinnesreiz eine überwiegende Rolle, während der Stichling mehr durch Bewegung und Form beeinflusst wird. F. Pauli (Leipzig).

358. Alverdes, F., Beobachtungen an Ephemeriden- und Libellenlarven. *Biol. Zent.*, 1924, **43**, 577–605.

(a) Das Komplexauge als tonisches Sinnesorgan. (b) Ueber das Verhalten der Agrion-Larve. In (a) wird gezeigt, dass die Zerstörung eines Komplexauges bei Ephemeriden- und Libellenlarven den Muskeltonus der anderen Seite herabsetzt. Verdunkelung hat

ähnliche Wirkung. In (b) soll erwiesen werden, dass die Libellenlarven keine "Reflexmaschinen" sind. Die Larven zeigen zweierlei Reaktionen auf äussere Reize: Abwehr, und Zuschnappen zum Beutefang. Diese Reaktionen treten nicht maschinenmässig auf Reize hin auf, sondern sind auch von "inneren Zuständen" abhängig. Die Gegenwart eines anderen Individuums derselben Art wirkt "hemmend" auf die Fangreaktion. Das Auftreten zweier gleichartiger Reize, die an sich Fangreaktion auslösen, wirkt nicht addierend, sondern der zweite Reiz hebt unter Umständen den ersten auf. Auf optischen wie auf taktischen Reiz reagiert die Agrion-Larve in identischer Weise. Schmerzsinn ist anscheinend vorhanden. Tiere, deren wichtigster Sinn (bei Agrion-Larven der Tastsinn) ein anderer ist als beim Menschen müssen auch anders strukturierte Vorstellungen haben. F. Pauli (Leipzig).

359. Reinke, J., Zur Prüfung der psychobiologischen Hypothese. *Biol. Zent.*, 1924, **43**, 630–638.

Reinke nimmt hier Stellung zu der Frage, ob psychische Kräfte als treibende Faktoren aller Lebenserscheinungen zu betrachten sind oder nicht. Während A. Wagner "Das Zweckgesetz in der Natur" die Eigentümlichkeit organischen Geschehens ausdrücklich in der Wirksamkeit psychischer Faktoren sieht, bleibt Reinke bei seiner Einteilung der Natur in physische, diaphysische, und psychische Vorgänge. Die diaphysischen Kräfte charakterisieren das Organische. Der Hauptunterschied der beiden Anschauungen liegt darin, dass Reinke Unbewusstes nicht als Psychisches anerkennen will. F. Pauli (Leipzig).

360. Pringsheim, E. G., Der Lichtsinn der Pflanzen. *Klin. Woch.*, 1923, **2**, 175–177.

Bei den photoropischen Erscheinungen reagiert nicht der einseitig belichtete Pflanzenteil als Ganzes. sondern es findet eine Reizleitung statt, die von der belichteten Spitze des Keimlings nach den basal gelegenen Teilen hinführt. O. Klemm (Leipzig).

361. Pfaffenzeller, F., Über Sinnesorgane am Reusenapparat verschiedener Fische. *Zoolog. Jahrb.*, 1923, **44**, 613–626.

Sowohl bei Fischen, die reine Planktonfresser sind, wie bei solchen, die gröbere Nahrung zu sich nehmen, sitzen an den vorderständigen Reusen und im Kiemenkorbe Sinnesorgane, die vermut-

lich nicht als Geschmacksorgane sondern als Tastorgane zu deuten sind. O. KLEMM (Leipzig).

362. MAGNUS, R., Körperstellungsreflexe bei neugeborenen Tieren. *Skand. Arch. f. Physiol.*, 1923, **43**, 39–44.

Kaninchen, Katzen und Hunde besitzen unmittelbar nach der Geburt die für die Körperstellung erforderlichen Labyrinthreflexe und die übrigen Reaktionen in grosser Vollständigkeit. Das Meerschweinchen, das mit offenen Augen geboren wird, hat ausserdem Reaktionen auf Progressivbewegungen, nur der Drehnystagmus fehlt ihm noch. O. KLEMM (Leipzig).

363. RÉVÉSZ, G., Experiments on Animal Space Perception. *Brit. J. of Psychol.*, 1924, **14**, 388–414.

I. *Why Do Hens Not Peck in the Dark?* The effect of sudden and of gradual decreases in illumination upon the pecking response in hens was studied. It was found that the pecking response disappeared in darkness, and likewise when the grain was hidden from view by a cover. As the hen only pecks at objects at which it can aim optically, it fails in darkness. This failure persists even when the hen is very hungry. It is possible, however, to train some hens to peck in the dark.

II. *Investigations of Illusory Spatial Perception in Hens.* After hens were trained to take grain from the smaller (objectively) of two similar figures, grain was placed on two equal segments (Jastrow illusion) and upon two equal rectangles, one vertical, the other horizontal (overestimation of vertical distances). The hens took the grain from the *subjectively* smaller figure, showing that the illusory effect exists for them as well as for humans. J. E. ANDERSON (Yale).

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EMOTION AND ENDOCRINE ACTIVITIES

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The endocrine glands have so close relation to the mind that no mental process can be completely free from endocrine influence in some way or other. Many hypotheses and guesses are current among students of endocrinology, but here it is endeavored to consider and evaluate the facts as far as possible with little heed to the fancies.

The term "endocrine" is adopted for indicating a gland with internal secretion; "hormone" for the active substance of the gland including both those of exciting and of inhibitory nature. "Autonomic nervous system" is used for the involuntary nervous system; "sympathetic" for the part of the autonomic as emerging in the thoracic-lumbar region of the spinal cord; and "parasympathetic" indicating the cranial and sacral parts of the autonomic. The main reason for the adoption of these terms is for convenience and custom, and the same is true of the other terminology used.

We have shown that the emotions are expressed in bodily changes, in the main, through sympathetic innervation, and that the chief endocrine organs so far as we know are brought into action by the nervous impulses by way of the fibers belonging to the sympathetic domain. From these facts it is to be expected that the emotions would stimulate the endocrine organs to extra activities and these endocrine activities would contribute to emotional somatic expressions. The vast significance of the elucidation of this problem for the widespread field of science, hygiene and culture hardly needs to be mentioned. But this is by no means an easy task.

Although the pioneer work of Dr. Cannon on a part of this subject first appeared in 1911, and this specific problem has been eagerly

discussed on the basis of laboratory experiments by prominent physiologists corroborating or contradicting Cannon, general agreement has not yet been attained. As regards most of the other glands our knowledge is too vague even to arouse much argument among investigators. The importance of the task, however, is so great that we urgently wish to know anything available in regard to the problem.

The relation of the emotional and endocrine activities has two phases; first, the influence of emotion on the endocrines; and second, the influence of the endocrines in arousing emotion. These two will now be considered:

1. The Emotional Influence on the Endocrine Activity

A. The Adrenal Gland

We have no definite information about the secreting mechanism of the adrenal cortex; our knowledge in this connection is confined to the medulla.

The work of Cannon and de la Paz on this subject seems to have already become classic, and it is hardly necessary to state it here except for criticism.

An isolated strip of rabbit intestine muscle, previously known as a sensitive indicator of adrenalin, was used in this experiment as the test object which was rhythmically contracting in a glass cylinder containing oxygenated Ringer's solution at body temperature. Minute doses of adrenalin were used to inhibit the contraction. Cats, excited when barked at by a dog while they were fastened in a holder, "presented the typical picture with scarcely a movement of defense" (14, p. 44). In each case samples of blood were taken by a long catheter from exactly the same region of the body—the inferior vena cava near the lumbar adrenal veins—before and after the barking. Blood from the quiet normal animal, or that taken before the excitement, produced no relaxation of the intestine strip. On the other hand, blood from the animal which showed emotional excitement, evoked the characteristic inhibition. In some instances the rate of inhibition was paralleled by the length of exciting time (14, p. 55). That the inhibition was due to an increased adrenal secretion was inferred from the following facts:

(1) The effect was produced only by "excited" blood from the neighborhood of the adrenal veins, while the blood from the femoral vein or from the kidneys had no such property.

(2) Excitement four or five hours after the removal of the adrenal glands did not alter the blood and cause the typical inhibition, though the animal showed "all the characteristic signs" of emotion.

(3) All variation of inhibitory action of the "excited" blood was duplicated by adding to inactive blood varying amounts of adrenalin.

(4) The effective blood lost its inhibitory power after three hours of exposure to bubbling oxygen. This same procedure is known as the one for destruction of adrenalin.

From these facts the conclusion was drawn by the authors that "the characteristic action of adrenin on intestinal muscle was in fact . . . due to secretion of the adrenal glands, and that that secretion is increased in great emotion" (14, p. 59).

These considerations justify us in attributing the secretion of adrenalin to emotion, for the animals, as above cited, showed the typical picture of excitement without marked muscular exertion.

No evidence, however, that adrenalin thus increased is poured out into the general circulation of the blood and consequently acts on the various organs of the body, was brought forth in these experiments. On the contrary, they rather tend to show the reverse, which gave Gley the opportunity to attack and deprive Cannon of the most important credit for his experiments.

The experiments of Hitchings, Sloan and Austin, on cats, cited by Cannon, and Crile's tests on rabbits and cats (30, p. 147) all confirmed Cannon's results, using his method. But apparently the above question raised by Gley was still left unsolved. Moreover, Stewart and Rogoff (93) failed to obtain positive results by the method of Cannon and de la Paz. "It may be stated, however," said Cannon, (15, p. 406) "that the method is difficult and exacting, and that not until after some experience with it did it begin to yield us positive result."

Eventually, however, Cannon found a simpler and more unmistakable method. A denervated heart, in the body of the animal experimented upon, which is a highly sensitive organ to adrenalin, was made use of as an indicator. Besides many important advantages enumerated by himself (15, p. 407), this method serves also for solving the question as to the adrenalin outflow into the general blood stream in consequence of emotional excitement. The stellate ganglia, the right vagus nerve, and the left vagus nerves were cut at intervals (no time is stated). The heart thus completely disconnected

from the central nervous system, no agency but through the blood can exert its influence on the heart beat. The graphic record of the heart beat showed that in a cat with the intact adrenal glands the rate was 217 beats per minute when the animal was calm, and 255 when excited. Two days after the bilateral adrenalectomy the rate was just the same as before removal when the cat was tranquil, 217. In three minutes it rose to 221 by excitement (15, pp. 414–415). Here no detail was stated about the manner of exciting the animal, yet presumably the same procedure as in his earlier experiment was used. Objections were raised against this result's being taken as the evidence of emotional increase of adrenalin output, by Stewart and Rogoff, for the reason that the faster beating of the denervated heart can be explained by a "redistribution of blood in the body" (94, 95).

This objection was put to test by Cannon and Rapport. They found that, even though all possibilities of redistribution were previously prevented by tying the blood vessels and severing the nerves, the more rapid beat could be elicited by stimulating the afferent nerve, which, according to Cannon, exerts the same influence on the adrenal glands as emotional excitement, so that is to be taken as a representative stimulus (21, p. 308). At the same time they found that the residual reflex acceleration of the heart after adrenalectomy (for which reason Stewart and Rogoff denied its dependence upon the adrenalin increase) was chiefly due to some unknown secretion from the liver. Excluding this factor by cutting the hepatic nerve, Cannon and Carrasco again confirmed that the adrenalin increase is responsible for the accelerated beat of the denervated heart (26). The foregoing evidence seems to be sufficient to show clearly that the adrenalin is increased in outflow into the blood and carried to the general circulation in consequence of emotional excitement.

Gley's failure to detect adrenalin either in the blood of the vena cava above the hepatic vein or in the blood of the heart, taken after splanchnic stimulation, and tested by a rise of blood pressure on being injected into a second dog, was, perhaps, as pointed out by Cannon (15, p. 428), due to the too small amount of adrenalin being doubly diluted. Tournade and Chabrol's recent experiments seem quite capable of settling this problem. Venous anastomosis was made in one instance between the jugular of one dog (A) and the right adrenal vein of another dog (B), and in another instance between the adrenal vein of one (B^1), and the superior vena cava

of the other dog (A^1). On stimulating the splanchnic nerves of one dog (B or B^1) whose suprarenal vein was operated upon, all signs of adrenalemia—a rise of blood pressure, increase of blood sugar, and dilatation of pupils—occurred in both animals. The blood taken from the animal in the height of adrenalin action caused no rise of blood pressure in the third dog when injected intravenously. These experiments obviously show that:

(1) The splanchnic stimulation brings forth the above phenomena in two ways, *i.e.*, by activating the adrenalin output and by nerve impulses, for the donor in these experiments has received no adrenalin in its own blood stream; and (2) the small amount of adrenalin is inactive when diluted into the blood of the body (**101, 103**).

In addition to all the direct evidence for the stimulating effect of emotional excitement on the adrenal activity, some indirect but important evidence is reported. That injection of the suprarenal extract produces in animals glycosuria was first found by Blum (**3**, ii, p. 246). Soon after this, Herter confirmed the fact with adrenalin. MacLeod has shown that the splanchnic stimulation will cause glycosuria, but will not do this if the suprarenals have been removed (**3**, i, p. 169). A number of clinical reports suggested that emotion would give rise to or facilitate the glycosuria, so-called "emotional glycosuria" (**14**, p. 67–68).

These observations are ample to infer that the glycosuria may be produced by adrenalin increased as the result of emotional disturbance. This inference was put to test by Cannon, Shohl, and Wright. Cats were used as the experimental animals. On being bound gently to the holder, some animals became so excited that "Young males usually became quite frantic, and with eyes wide, pupils dilated, pulse accelerated, hairs of the tail more or less erect, they struggled, snarling and growling, to free themselves" (**14**, p. 71). In all cats used (12 in number) including both excited and calm, "a well-marked glycosuria was developed" by means of binding, whereas before the experiment and one day after it no sugar was found in their urine. The time needed for developing the effect was paralleled by the emotional state of the animals. In those which showed signs of excitement early, sugar was found much earlier than in animals which subjected themselves to treatment more calmly. Thus the length of time of sugar appearing varied from 30 m. to 5 h. Further assurance that emotion can be the sole cause was obtained from this, that three cats, in which no sugar had been secured by mere confinement

for many hours, now developed glycosuria after being much excited for 30 m. by a barking dog that jumped at them from outside the wire cage in which each cat was put. Similar instances in regard to various laboratory animals were quoted by Cannon (14, pp. 74, 75).

Emotional glycosuria holds equally true of human subjects. It is too well known to be stated here that Cannon, Fiske, Smillie and others found glycosuria in the Harvard football squad and students who underwent a hard examination (14, pp. 75, 76). The great European war offered many similar instances where the glycosuria was associated with the great emotional stress, such as in case of aviators after a flight, and citizens after being subjected to the perils and excitement of bombardment (16, p. 27). Clinicians have long observed the emotional glycosuria elicited by emotional conditions. This is especially obvious in cases of diabetes. An interesting case is given by Pottenger. A diabetic who had become sugar-free " was playing croquet when a ball bounced and struck him on the chin. He was frightened and suffered some pain, and immediately had a return of sugar " (3, i, p. 168). In contrast with the foregoing cases is the well known fact that sugar is rarely found in the urine of patients or animals which have undergone severe operation or treatment during anesthesia.

That not only exciting emotion but depressive affection also may give rise to the condition of glycosuria seems to be true from the cases of students under hard examination as above referred to. But sugar in the urine, as pointed out by Cannon, is only a coarse indicator of the increment of sugar into the blood, and does not show the fine variations which the examination of the blood itself does. The most extensive study of glycemia of patients suffering from depressive melancholia was recently reported by Kooy (59). According to him, in melancholia the glycemia is much higher before meals, and in great excess shortly after a meal, disappearing more slowly than in normal individuals.

	Before breakfast, per mil.	¾ hr. after breakfast, per mil.	1½ hrs. after breakfast, per mil.	2¼ hrs. after breakfast, per mil.
Normal	0.98	1.14	1.16	1.04
Melancholics	1.13	1.63	1.45	1.19

The above evidence, both the laboratory experiments and clinical reports, agree altogether in one point, that emotional disturbances of any nature, exciting or depressive, may result in glycemia. Thus

Watson devises a new method for detecting the emotional effect of a stimulus making use of the blood sugar test (13, p. 220). It is certainly "unquestionably a very delicate indicator and revealer of emotional changes." But our concern is to see the adrenalin action in the mechanism of increasing the blood sugar content as the result of emotional disturbance. This is really a difficult matter, and there is much dispute among authorities (14, p. 77).

Cannon and his co-workers came to the conclusion that "the adrenal glands perform an important contributory rôle in the glycosuria." This was based on their experiment in which three cats, which had given quick glycosuria before, showed no trace of sugar in the urine after adrenalectomy, though the degree of excitement manifested was unchanged before and after the removal (14, pp. 77–78).

A good many observers, on the other hand, found that after removal of the glands glychemia or glycosuria could be produced. Among them Stewart and Rogoff appear to be the representatives, for their works have taken into consideration the available data on both sides, and apparently under the most careful conditions. Stewart's statement is as follows:

"Whatever the mechanism of their [experimental hyperglycemia] production may be, the suprarenal bodies are not essentially concerned. . . . There is no evidence that 'emotional hyperglycemia,' if it exists, is at all related to the epinephrin discharge from the suprarenals. The possibility may be admitted that different species of animals, perhaps different individuals of the same species, may vary in their susceptibility to emotional excitement as regards changes in the blood sugar content. If this were so, man might be expected to be more susceptible than lower animals. Cannon, Shohl and Wright saw glycosuria regularly in cats as a result of emotional excitement, and Cannon found it in some of the students of a class subjected to the stress of an examination, and in football players" (3, ii, p. 160).

Obviously he denies the adrenals as an important factor in the glycemia mechanism, although he tends to recognize the existence of the emotional glycemia. No possible cause, however, is proposed.

However, negative evidence as a rule, including Stewart and Rogoff's, is adduced with the other conditions, as asphyxia, anesthesia, or piqûre, rather than the emotional states, and if the glycemia or glycosuria associated with the latter situation is to be fundamentally distinctive from that induced by others, as Stewart and

Rogoff claimed (3, ii, 160), this negative evidence is not only indirect but also entirely irrelevant to the emotional glycemia.

On the contrary, a considerable amount of positive evidence, direct and indirect, is brought out by many reliable investigators, including Cannon. Elliott has seen the lessening of the residual adrenalin content in the cats a day or so after they were admitted in the laboratory. They were described as "sulky, ready to snarl at their comrades, and very suspicious of their surroundings" (36, p. 379). Lewis' unpublished results, referred to by Watson (113, p. 220), conclusively showed in animals "that if the adrenal glands are removed emotional stimuli will not cause this increase in sugar either in the blood or in the urine."

Besides the direct evidence, there has been brought forth copious indirect testimony that injection of adrenalin produces glycemia, and removal of the glands prevents the occurrence of the phenomenon applying the possible stimuli (3, ii, pp. 247–249). Recently Carrasco added one support of this nature by a new method utilizing the denervated heart as an indicator of epinephrin. And he found that piqûre increased the heart-rate and that adrenalin also increases in consequence of piqûre (28).

It may be safely stated, therefore, that adrenalin is one of the important factors, if not the sole cause (100) in the production of glycemia in any case, including the emotional glycemia.

Returning to the original problem, another indirect support for the emotional output of adrenal secretion was brought out by Cannon and Mendenhall. After showing that the clotting of the blood is hastened by excitation of the splanchnic nerves, when the adrenal glands are intact, they found that the blood taken from the excited cats showed marked less length of coagulation time as compared with the calm animals. The cutting of the splanchnic nerves abolished the shortened effect of the excited blood. Cannon's previous works show that intravenous injection of adrenalin hastens the clotting time. Considering this fact with the above observation, they came to the conclusion that emotion induces the faster clotting of the blood and that this was effected by increase of the adrenal discharge. Histological changes in adrenal glands as the result of strong fear is alleged by Crile to be the effect of characteristic exhaustion (29, p. 198).

B. *The Thyroid Glands*

"Unfortunately, the thyroid cannot be studied to advantage either functionally or histologically, for there is as yet no available test for

thyroid secretion in the blood as there is for adrenalin, and thyroid activity is not attended by striking histologic changes." During the last decade various forms of tests for thyroidal secretion were advanced by many investigators (3, i, pp. 259–280; 89, pp. 361–364) but unfortunately the above statement of Crile (29, p. 213) seems to be still true. The denervated heart that was first used as an indicator of adrenalin by Dr. Cannon, was utilized by him for testing the thyroid secretion, too, because the effect on the heart-rate of each gland has characteristic aspects. By using this he and his collaborator obtained a remarkable result of thyroid secretion in consequence of afferent stimulation (24). If we think of the fact that this stimulation and emotion are always found by Cannon to have the same effect as adrenalin augmentors—indeed in a case afferent stimulation was treated as the representative of these adrenalin stimulations (21, p. 309)—we are not far from being justified when we take the above experiment as an indirect proof of emotional secretion of the thyroid. But this is no more than a mere analogy, and despite Cannon, assuming the probability of thyroid extra-activity in times of emotion, left the determination to future researches, no direct study is yet reported by him (20, p. 78). By using the method of the denervated heart it is highly desirable that the direct test for the emotional effect on the gland be furnished.

It is stated by Crile, a distinguished student of the thyroid, that the function of the gland is best evidenced by its rôle in the production of fever. Using this function he gives a more or less direct proof that "normal rabbits subjected to fear showed a rise in temperature of from one to three degrees, while two rabbits whose thyroids had been previously removed and who had then been subjected to fright, showed much less febrile response" (29, p. 217). From lack of detailed description it is impossible to know what was the stimulus used to make the animals fear, and to what extent they responded. And, if we trust him about the mental and physical conditions of the experimental animals, there is another questionable point, *i.e.*, whether fever is specific, and therefore, reliable enough as an indicator of the internal secretion of the thyroid. At any rate, however, it may serve as supporting evidence for the increase of thyroid secreted by emotion as the experiment was carried out by so competent an investigator.

If we are permitted to use theoretical speculation, it is very probable that the thyroid is called into extra activity in affective disturb-

ance, because (1) emotion is usually expressed along the sympathetic regions, and the thyroid is innervated and capable of being stimulated by the sympathetic fibers; (2) adrenalin stimulates the sympathetic activity in general, and, further, activates the thyroid secretion, as demonstrated by Cannon (20). Emotion, on the other hand, is proved to act on the adrenals increasing their internal secretion. These two possible relations may render the conjecture reasonable that there exists somewhat direct and indirect connecting channels of activity between emotion and the thyroid.

Direct experimental evidence is very meager, as seen above. Another mode of substantiation is clinical observation. Apparently Crile concedes too much to his own theory when he says: "Fortunately a vast number of clinical observations show a direct relation between the thyroid gland and the emotions" (30, p. 140), for exact clinical observation is just as difficult as the laboratory observations and, indeed, the situation is more complicated, as will be seen.

The etiologic theories of the so-called hyperthyroidism are not uniform. Besides toxic and infectious theories, two main theories regarding the relation of the thyroid and nervous system are conflicting; the one is the thyrogenic, the other the neurogenic theory (3, i, pp. 309–314). Which is the cause and which is the effect seems to be quite impossible and unnecessary to determine, for the condition of the onset may be able to vary according to the vast number of factors concerning the disease—personal character, predispositions, chance circumstances, etc. Probably both the thyrogenic and neurogenic theory may be duly applied to individual cases with varying conditions, and neither alone may cover the general cases.

Hyperthyroidism, whatever the cause may be, is a disease of the thyroid gland, with the condition of hyperactivity or dysfunction. In exophthalmic goiter it is generally believed that there is increased thyroid substance in the patient's blood, although for lack of exact test how much is not known. "It is difficult," says Schäfer (89, p. 364) "not to believe that there is constantly a very small amount of thyroid secretion circulating in the blood, and that this amount is increased in exophthalmic goiter." The term exophthalmic goiter is used by the average investigator to indicate a most fully developed case of hyperthyroidism, and very often as a synonym for Graves' or Basedow's disease, although some, especially quite recently, propose the distinction between hyperthyroidism and Graves' disease and exophthalmic goiter.

Of course the nervous system is not identical with the mind, but no one can deny the close attachment or nexus, as Sherrington calls it, which exists between the two. So, roughly speaking, the neurogenous is psychogenous, if we take the meaning of the former in a general sense without putting special emphasis on a particular part of the nervous system.

Many European investigators have observed the "war diseases" which were occasioned by the last Great War and the psychical or nervous agitation was considered as the direct cause of these diseases which involve endocrine disorders. Of these there are the "war Basedowism" studied by Rothacker, Stoney and others; the "war Addisonism" mostly studied by Sergent and other French observers; the "war diabetes" observed by Von Noorden (80, p. 332). Rothacker has shown many cases of soldiers who manifested an acutely developing Graves' disease caused by nerve concussion and mental excitement from machine-gun fire and trench warfare. A rest of several months' duration resulted in inevitable recovery. He also described similar cases from civil life which showed as the result of mental and emotional excitement, not only a remarkable enlargement of the thyroid, but also typical Graves' disease of which pathological symptoms soon disappeared when the psychical causes were removed (83). From these instances and many others he seems to believe many cases of Graves' disease are of nervous origin. Pende, a well known Italian neurologist, appears to advocate the same theory. But he thinks the neurogenic endocrine disorders are more incomplete, mild, temporary, and easily curable than the endocrinogenic (80, p. 332). Stoddard observed exophthalmos and a swollen thyroid in numbers of people during the German air raid on London, and he believes in the psychical origin of exophthalmic goiter (97, p. 375). Marañon, according to Cannon, has collected a large series of similar cases and has attributed the cause of them to emotion (16, p. 28). Gowers is referred to by Howard as stating that many cases of exophthalmic goiter occurred in Alsace and Lorraine during the Franco-German War of 1870 (3, i, p. 307). The same idea was apparently possessed by Rothacker, for he seems to see the primary cause of Graves' disease in the mental strain or emotional excitement, while the thyroid is secondary. Although in quite different thyroidal substances, qualitatively and quantitatively, from those usually alleged, Janney attempts to find the accountable toxic material of

Graves' disease; he also claims the psychic elements as the stimulators of these substances (55, p. 809).

The great excess of female cases of exophthalmic goiter over the male may have some significance in this connection. The ratio between the sexes is differently reported. Mackenzie has stated the proportion from statistics of cases in England and Wales during the four years (1911–14) as 10 females to one male (66), while in the United States 5.6 to 1 is reported from the Mayo clinic. The latter is approved as approximately correct by Howard (3, i, p. 306). The predominance of emotional life, and greater susceptibility to stimulation likely to cause affective disturbance, of the female, must be factors of great importance to be taken into account for the explanation of the phenomenon in question. If it were so, this is one of the indirect proofs of the fact we are trying to establish.

From the foregoing review of the clinical observations it may be justifiable to say that emotion will cause the hyper-secretion of the thyroid just as well as of the suprarenal glands.

We can hardly leave the discussion of the emotional influence on the thyroid without considering the affective psychoses in relation to the thyroid gland. Parhon showed that the average weight of the thyroid of insane people is largest in the affective psychoses—*i.e.*, mania, melancholia, mania depressiva—and least in epilepsy. Kojima, as a result of extensive post-mortem study of 110 cases of insanity, found no definite relation between the thyroid weight and the affective psychoses in the male, whereas in many female cases of affective psychoses he found a very large thyroid (57, pp. 36–37).

Regarding the histological changes of the gland in dementia precox, the results of various investigators are not uniform; *i.e.*, some show an alteration of hyperfunction, while others show sclerosis connected with hypofunction (8, pp. 400–401; 57, p. 89). Kojima observed a tendency to hypofunction in the male and to hyperfunction in the female (58). The number of his cases is rather small; but here again, as in his other study above referred to, we can see the preponderance of the female in hyperthyroidism.

Borberg seems to be sceptical of endocrine function in connection with mental disorder. To quote his words: "It is probable that the endocrine changes in etiological and pathological relation to every case as a part of psychoses may play a rôle. But in our present psychopathological classification no anatomical parallel can be drawn (8, p. 461)."

Recently, however, Witte has succeeded, more or less, in throwing light on the problem of the anatomical relation between the thyroid and dementia precox. As the results of study of 815 cases of dementia precox from the Institute of Bedrug, he found that in dementia precox (schizophrenia) the number of the cases of thyroid atrophy was remarkably small as compared with other forms of insanity (epilepsy, paralysis, etc.), and with mentally sound people. The influence of somatic diseases, like tuberculosis, heart disorder, and infections, very common in dementia precox, was studied by comparing the conditions of the glands of: (1) dementia precox patients with those of mentally sound people, both suffering from these diseases; and (2) the cases of dementia precox with those of other insanities, both free from these somatic diseases. In all cases the schizophrenic type showed a markedly low ratio in frequency of thyroid atrophy. "It may be well assumed," he stated, "that the relatively rare occurrence of thyroid atrophy is the fundamental of the disease of dementia precox, and of its bodily characteristics" (115, p. 195). We could cite abundant instances that illustrate thyroid hyperfunction in dementia precox, especially in affective psychoses.

The inference may be justified, then, that there is a close relationship between dementia precox in general and especially the affective psychoses and the thyroid hyperactivity—or at least infrequency of its atrophy. Now the question would be naturally raised: "Which is the cause, and which is the effect; the psychic process or the disease?" This is indeed a difficult problem. Unfortunately in our present knowledge no one, perhaps, can venture to offer any competent answer. Roughly speaking, however, there seem to be two tendencies among authorities, one looking for the cause of the disease in psychic, the other in organic disorder. The scope of the term dementia precox is too large and vague to make us hope to find its real and consistent cause in any definite factor or factors. Both psychical and organic origin can be duly assumed in dementia precox at large, or in a somewhat specific subdivision of the group as affective psychoses. Therefore, until a clearer division is provided and more definite etiology is advanced for each division we may have to be content with both of the causes now assigned, as alternatives having the same weight. If so, we may be justified in assuming that the tendency to thyroidal hyperfunction in dementia precox is caused, at least partially, by emotional conditions no matter whether exciting or

depressive in nature. With the cases of exophthalmic goiter during the war the inference of emotional origin is more reasonable. This may gain support from a study of Henderson who, by analyzing the precipitating causes of the anxiety psychoses of his cases, obtained the following results:

	Women	Men
Mental	37	23
Physical	14	4
Combined	14	5
	65	32

"Thus in 57 per cent women and 71 per cent men the etiological factors were mental, whereas physical factors were of importance only in 21 per cent women and 6 per cent men" (50, p. 278).

The death of near relatives, financial and business worries, unfortunate home conditions, the breaking up of the home, etc., are counted by him as the mental cause. Possibly the strongest and most abundant supporting instances of this theory are found in the books on psychoanalysis. Most recently Stoddart has expressed the view quite strongly, that the organic changes are secondary to the purely psychical disorders which are the primary and fundamental cause of dementia precox and of hyper- and hypo-thyroidism. This psychical cause is capable of modifying the endocrine secretions, and thus producing considerable organic changes (97, pp. 375, 378).

In concluding we should say that the theory that emotion stimulates the thyroid secretion to increased outflow, still lacks direct evidence, but, on the other hand, it can be proved fairly well by a good many indirect observations. Nevertheless, experiments of direct test are highly desirable.

C. *The Pituitary Body*

The pituitary body, as we have already mentioned above, is a complicated one, structurally and functionally. Moreover, the exact physiological activities of the hormone secreted from the different parts of the gland are not clearly established. Accordingly we have to be content with rather obscure evidence in any aspect of this organ; especially the experimental work attempted on the emotional influence on the gland has seldom carried on.

The only available record accessible to me is the one of Uno (105). His experiments were made with 41 pairs of albino rats. Two males from the same litter were put in a wire box, the wooden bottom of

which was studded with the blunt ends of nails. The nails were connected with the dry batteries through wires, thus the animals were stimulated for 4 seconds per minute throughout the experiment. By the electric stimulation and others such as pricking or pinching the tail, the animals were made to fight for 1, 3 and 6 hours. Some pairs fought severely, and were often clearly exhausted at the end of the experiments. Right after the experiments the animals' glands were dissected and compared with those of the controls from the same litter.

The results showed the following: (1) In the groups which were stimulated and fought for 3 or 6 hours, a slight average increase of the weight of the hypophysis was noted. But a difference in severity of the combat did not show any differentiation in the weight of the gland. On the other hand, deviation in the weight of the gland from that of the controls was greatest in the group of 3-hour fighting; in this group, again, the number of severe fights was also greatest. (2) The extract from the gland of the experimental animals showed the *contraction* of an isolated intestinal strip, adding a small amount (1.6 to 2.5 cc.; 25:10,000), whereas the extract from the control gland, prepared in the same manner, showed *relaxation* of the strip. This contraction occurred with the extract from all animals submitted to 1, 3 or 6 hours stimulation and fighting, or either electric stimulation or fighting alone; but did not appear from that of animals which had been subjected to less than one hour of either excitement.

Now of these results the first one probably does not deserve much attention, because increase of the weight of the glands in this case apparently shows little relation to excitement. The result with the group of 3 hours fighting, may be attributable to age, for that was the group of greatest maturity. The second result—modification of action of the extract—is promising. No explanation is given by the author. He only says, "stimulation or fighting changes the hypophysis so that the extract from the test hypophysis acts on the strip of the intestine like the glandular extract taken alone." This statement is made on the author's belief that the extract from the glandular part (anterior lobe) of the pituitary of the rat causes a marked contraction of the intestinal strip, while the extract from the nervous portion (posterior lobe) gives a relaxation. This belief, it is stated, is based on his own experiment which is supported by Degener's.

Shamoff, however, could not see any influence of the extract from the anterior lobe of sheep and oxen on the rabbit's intestine; while she did see marked *contraction,* after a transitory relaxation, induced by the posterior part of the same glands from which the anterior lobe extract was taken (86, pp. 276–277). Many experiments resulting in the same effects of the posterior lobe extract as those of Shamoff are cited by Hammet (3, i, p. 756). If this be true, the contracting effect seen in the test hypophysis in Uno's experiment must be ascribed to the posterior lobe instead of the anterior part.

What it may be, the different effect which Uno observed between the test and control hypophysis is unexplainable in our present stage of knowledge of the pituitary gland. Still, however, his experiment is interesting as well as suggestive in connection with our present problem; it would be more so if his procedure with the intestine and the degree of dilution of the extract added had been described more fully.

The clinical proof is very meager. For the active substance secreted from the anterior lobe of the gland, tethelin, is mostly concerned with the growth and development of the organism, especially the bony structure, thus the action of it is gradual; and pituitrin, the hormone from the posterior lobe, and, perhaps, from the pars intermedia, is not yet clearly known in its chemical nature. The effect of the latter, so far as it is known, is not specific enough to be judged from external diagnosis, being blurred by the action of the hormones from other endocrines—adrenalin and thyroid secretion—stimulated in common, as is ordinarily the case. "Only of late," writes Cushing, "with the development of roentgenology and the more extended use of the ophthalmoscope and perimeter can a diagnosis of pituitary disease apart from acromegaly be made with any probability. Unlike thyroid enlargement, a hypophyseal growth can be determined only by indirect methods; for next to the brain itself, the hypophysis lies in possibly the best protected and most inaccessible place in the body—one reason for assuming that it may be a most important member of the endocrine series." (46, pp. 57–58)

Frequently emotional disturbances are assigned as the preceding condition of acromegaly, according to Bassoe (3, i, p. 809), though this is confined to female cases. Pel is referred to by him as reporting three instances, so convincing that emotional shock should be accepted as an etiologic factor. If we think, however, of the fact

that the disease of acromegaly is quite rare and chronic in nature, and, on the contrary, that our emotional stress is so common, and usually transitory, we must admit that Pel's claim, which has no further support from other investigators, can not be accepted without doubt.

The matter is equally obscure in connection with the posterior lobe. Pituitrin, as above noted, is not yet purely isolated, and, it is said, probably has more than one component substance; for the effect of it oftentimes indicates quite opposite action on the same bodily structure and function. This causes much error and misinterpretation, not only in clinical but also in experimental investigations. Thus, naturally, conflicting conceptions prevail among students about the characteristic functioning of the drug. Polyuria, for example, is a popular clinical symptom coexisting with hyper- and hypopituitarism, and has been formerly considered as a result of hyper- (**88**, p. 113) or hypofunction (**31**) of the posterior lobe. If this be true, it is very promising evidence for assuming the emotional influence on the hypophysis. But from recent works (**3**, i, pp. 732, 879–880) its specific connection with the pituitary gland seems to be rendered unstable. The same destiny is menacing the glycosuria in which clinically, experimentally the posterior lobe has been alleged as playing at least one important part. Practically all possible clinical procedures are deprived of the promise of furnishing evidence of any kind for emotional influence on the pituitary body. This, of course, does not include the other clinical syndromes assigned to the hypophysis.

D. *The Liver and Pancreas*

There is no direct proof in literature that these glands may be directly affected by emotional conditions. Cannon's study to which we have referred above, showed that emotional excitement gives rise to glycosuria in animals, and numerous clinical observations have shown affective disturbance associated with glycosuria. The exact mechanism of the appearing of the glycosuria is in dispute. The liver, pancreas, adrenal, thyroid, and nervous system, and to some extent the pituitary body, are all considered more or less as playing certain rôles in sugar metabolism.

Many theories are proposed from various experiments. The effect of these endocrine glands, or even of the liver itself, on glycogenolysis, has sometimes proved slight. Pharmacodynamically

such hormones as adrenalin, thyroxin, pituitrin, are known as the stimulators of the glycogenolytic function; and on the other hand, most recently, since the discovery of the pancreatic hormone, insulin, the inhibiting effect of this drug has been eagerly studied by many, but the exact physiological mechanism is not yet fully determined.

In emotional glycosuria just how these organs partake we do not know. But if we admit that adrenalin performs an important rôle in this case; and that, as is usually thought, adrenalin acts on the glycogen content of the liver via the pancreatic hormone, these two endocrine organs, the liver and pancreas, become the sharers in emotional glycosuria.

According to many authors (Cannon *et al.*), adrenalin inhibits the pancreatic endocrine function which regulates the conversion of glycogen of the liver into glucose, and thus as the result of excessive increase of glucose in the blood the glycosuria ensues. If so, we may say that indirectly the internal secretion of the liver, if we may be allowed to call glucose an internal secretion, is increased, and, on the contrary, that of the pancreas is decreased or arrested by emotional stress. Theoretically this may be possible, if we follow one of the prevailing doctrines. Direct experiment, however, alone can give a clear explanation to this problem.

With regard to the other endocrine glands, we can state nothing about the influence of emotion upon them. From the study of physiologists, biochemists, and clinicians, the endocrine influence exerted upon the organism or on the central nervous system is relatively clarified. Unfortunately, however, the emotional effect on these glands has received very little attention, although it has equal significance. Indeed, in the normal condition the stimulation which activates and mobilizes our life is more dependent upon the psychical processes than on the bodily organs which are ordinarily called into activity by the former. Therefore, the study of this relation is, in some sense, more significant than the other.

2. Endocrine Influence on the Emotion

We have seen that emotional stress calls forth the endocrine outflow in increased amount. Now we are in a position to refer to the influence of the internal secretions on the emotional conditions. Indeed, the matter is of very great concern, because for completeness we have to describe the endocrine effect in its normal and altered states on emotion; and, further, the altered state in amount, in nature

for both increased and decreased cases. But this is almost impossible. A brief, incomplete description, which the available data would permit, would be the most within our power.

Injection of the active principle or the extract on the one hand, and the extirpation of the glands in question on the other, are the general experimental method. Implantation of the organs and the feeding of the glandular extracts are applicable methods for some glands.

Clinical and pathological observations also furnish important data. We shall present the apparently necessary data to the best of our ability without following any specific order.

A. *The Adrenal Body*

The locus where the adrenal secretion acts is generally believed to be the so-called myoneural junction, and not the central nerve cells, except in very few cases (3, ii, pp. 192–193; 252–255). Therefore if the nerve is severed from the central nervous system the effect of adrenalin is not interfered with, whereas, if the fiber termination is paralyzed no effect is seen, even if the tissue cell innervated by the fiber is irritable.

In this manner epinephrin acts on all the organs and tissues innervated by the sympathetic nerves and stimulates the activity of them; in other words, it stimulates the sympathetic action on the organism. Now it will be remembered that emotion expresses itself along the sympathetic realm activating the organs along that line, accelerating the heart rate, dilatating the pupil, etc. We have further seen that emotion calls forth the increased secretion of adrenalin. If emotion and adrenalin both elicit similar bodily reactions, and if emotion causes the adrenalin output, the questions naturally arise: first, what bearing has the epinephrin action on the emotional bodily changes; second, does it bring forth emotion itself or not?

A number of investigators noticed that the injection of adrenalin is capable of reproducing practically all the bodily signs which would accompany pronounced emotional conditions. None, however, described the adrenalin effect on the subjective emotional state so vividly as it is done by Marañón, an endocrine enthusiast in Madrid. When small amounts of adrenalin are injected into a human subject the general reactions are markedly yielded if the sympathetic system is sensitive. The blood-pressure rises, carbohydrate metabolism changes; localized tremor of hands occurs extending to the arms

and at times to the entire body; the face turns pale or becomes flushed, perspiration appears, at times tears flow, and mild polyuria ensues; the pulse rate increases, the mouth becomes dry, the pupils are dilated, the eyes become brilliant, and finally the sensations of respiratory and cardiac oppression are felt.

A sensitive subject, one with latent hyperthyroidism, gave the syndrome of terror without having been terrified, after receiving an injection of adrenalin. Oftentimes this circumstance was recognized by the subject himself who declared of his own volition "It seems as if I was afraid but I am calm." (Marañón, 68) This artificial reproduction of the emotional bodily response without the subjective emotion is very interesting and important in view of the classical theory of Lange-James. Cannon has given a similar instance. "Some students at the Harvard Medical School, who had engaged in athletic matches, testified after receiving an injection of adrenalin, that they felt just as they had felt before starting a race—'all worked up and on edge.'" (16, p. 29)

The foregoing observations show that adrenalin well imitates the emotional syndrome and leads the subject almost to the edge of subjective emotion. The bodily conditions are present. All that is lacking of the usual emotional experience, is the psychic aspect. It is interesting to see whether a subject in this condition has any advantage for the real emotion. This has been observed by Marañón.

"One of the female clinical patients spoke of her absent children, of the dangers they ran without her care . . . but all without emotion. Ten minutes after the injection, of half a mgm. of adrenalin the same woman gave evidence of the physical signs of emotion induced by the drug, but all without psychic emotion; mention of her children, however, was sufficient immediately to arouse bitter weeping. This experience has been repeated in countless other cases with a distinct intensity according to the pathological and temperamental circumstances of the individuals.

"It appears as if adrenalin can produce all the emotional syndromes except the psychic factor. This factor alone is lacking to emotional expression, and when we complete it with an emotional memory, which previously was insufficient to produce an emotional reaction because of the lack of the sensitization by the somatic element, the emotion is produced in all its integrity." (68)

There is nothing to be added any more to the above regarding the adrenalin effect on the subjective side of emotion, which we look upon as the real emotion. One thing, however, must be kept in mind, *i.e.*, the foregoing statements, valuable and interesting as they

are, are of interest especially from the pharmacological standpoint. Their physiological value is another question.

Cannon has shown, by matching adrenalin injection with reflex adrenal secretion measured by the denervated heart-rate, that when the heart rate is accelerated between 30 and 42 beats per minute, the output from the adrenal glands lies between 0.0032 and 0.0037 mgm. adrenin per kilo per minute (27, p. 337). The increased beat of the denervated heart, when the animal was emotionally excited in his early experiment, was 38 per minute. The rate of adrenalin output estimated in a case of the reflex secretion seems to be applicable, therefore, to the emotional secretion too, if we regard the adrenalin liberation in both cases as eventually identical in mechanism and in nature, as Cannon believes. That adrenalin of this amount (0.0032 or 0.0037 mgm.) is enough to produce a rise of blood pressure has been shown in the animal test (3, ii, p. 198).

Unfortunately we are not informed what amount of epinephrin would be secreted in time of emotional stress in the human being; and from this lack we are unable to tell to what extent Marañón's experiment is applicable to the physiological activity of adrenalin secreted in the emotional storm. In other words, we cannot tell to what extent the amount of adrenalin used in his experiments is over or under the physiologically possible amount in our body at the time of the affective disturbance.

Neither is our information less obscure with respect to the clinical evidence whether there is any condition of hyperfunction of the glands of such a nature that the secreted hormone would exert its influence on the emotional condition. Indeed, frequently tumor of the adrenal cortex is associated with hyperfunction of this part of the suprarenals, and the resulting symptom of pubertas precox is ascribed to the oversecretion of the cortical hormone. If this be true, it furnishes a significant support to the view that the adrenal cortex plays an important rôle in connection with the development of the love emotion. Unfortunately this theory does not seem to have strong foundation. Recently Krabbe suggested a plausible hypothesis. In reviewing the cases of cortical tumor, in the literature, he found that in the case of girls the associated syndromes do not characterize the true precocious puberty; for in most of the instances ovulation and menstruation, the essential factors of the female pubertas precox, are lacking. It is not pubertas precox, but a virilism, according to Krabbe, that accompanies tumor in the cortex of girls. Acting on

the belief that in the embryonic stage the inner medullary portion of the ovary is testicular, he has tried to explain the virilism on the theory that the tumor of the adrenal cortex has not really been developed from ordinary adrenal cortex cells, but from the fetal testicular cells which have been absorbed by the adrenal cortex and developed as a sort of false cortex (60, pp. 4–8).

If this new theory is to be taken as true, as Krabbe has claimed, the pubertas precox with tumor of the adrenal cortex has no connection with the function of the cortical part of the gland, but with the testes. A supposed important function of the cortex—that it has close connection with the reproductive organs—is once again thrown into obscurity by this theory.

After all, our knowledge either of the medulla or of the cortex of the adrenals is in so chaotic a state that we don't know of any influence which they exert through their physiologic hyperactivity on the mental processes.

The question what rôle does hypofunction play in connection with the present problem is of significance rather abnormal or pathological, with which we have little concern. A brief review, however, is unavoidable since it aids in a better understandng of the normal mechanism. The effects of acute insufficiency are best demonstrated by surgical extirpation of the glands in question. The effect of adrenalectomy, especially that on the sympathetic system, was best shown in a report by Elliot, based on his experiments on cats during 12 years before that time. In a series of 25 cats the glands were removed in two operations, three weeks to nine months apart. Survival ranged from six to twenty-three days after the second gland was removed. In another series of 21 animals both glands were excised simultaneously, the animals dying usually the second day. The symptoms were very similar to both series. The weight progressively decreased, the characteristic asthenia developed, as in general, just before death. Yet no variation was detected in the emotional state. To quote his words, "Emotionally it showed no annoyance, and would purr in a languid way until near the final collapse." (39, p. 40)

Cannon's cats showed the same signs of excitement or rage before and after the adrenalectomy. "Indeed," he stated, "one was more excited after removal of the adrenals than before." (14, p. 78, see also p. 57)

Stewart is of the same opinion as Cannon on this point, although

he goes farther than Cannon denying even the significance of epinephrin as the maintainer of the sympathetic irritability (3, ii, p. 165). From the foregoing evidence it may be taken for granted that, whatever influences the adrenal secretion, including that of the cortex, may exert on the mental factors, they are not of such a nature that the sudden deprivation of the adrenals causes gross changes.

One more point remains to be considered. If acute insufficiency fails to show any appreciable change in the emotional life of the subject, does it not affect him in a chronic manner? Unfortunately no answer is possible. It is true that Addison's disease seems to have a close connection with hypoactivity of the adrenals, and general mental defects as well as emotional disorders are described among the symptoms of the disease; but until the certainty of this connection is more clearly established it may be wise not to take this as being a representative case of underactivity of the adrenal body.

"Addison's disease," writes Vincent, "is still the only well defined syndrome recognized as connected with the adrenal bodies. It is sad to have to admit that up to the present time it has not been possible to correlate in any certain manner any of the physiological observations on the glands with what we know of the symptoms of Addison's disease. It may be, after all, that disease of neighboring nervous structures plays a part in the production of the disease." (110, p. 317)

All experimental works, indeed, have failed to produce the most characteristic symptom of the disease, pigmentation, artificially; and all attempts at the relief or amelioration of the disease by the introduction of the adrenal extract so far has ended in negative results. On this point we are in the same obscure situation as we find ourselves in regard to the condition of hyperactivity of the gland. In concluding we may quote Vincent again: "It is too early to attempt to diagnose clinically any syndromata due to hyper- or hypo-function of the adrenal bodies." (108, p. 144)

Suggestions as to the importance of the adrenal cortex in connection with the central nervous system are provided from another angle of the study. Sir F. Mott, from the post-mortem study of the glands, found that the cortex of the adrenals shows great diminution in weight, thickness and lipoid content in dementia precox. Because of the great importance of lipoid substance for the general living cells, especially for the early development of the cerebral

hemispheres, he seems to be of an opinion that the cortical cells of the adrenal glands have an important connection with the central nervous system. For the support of his theory he pointed out the fact that there is a correspondence in size of the adrenal cortex and the brain development in the animal series and a great diminution in size of the adrenals in anencephalous monsters (72, p. 15; 75, p. 700). Rossi of Madrid, referred to by Tucker, calls attention to suprarenal exhaustion and insufficiency in manic-depressive states and notes favorable results with suprarenal treatment (104, p. 262).

Indeed, a great effort has been made to find the endocrine connection with mental diseases; and as a result many important glands have been found in variations showing the possible relations, yet no definite correlation between the two is found, especially for the adrenal glands.

From the foregoing statements we may conclude concerning the adrenal influence on emotion, that in acute modes, for both over- and under-secretion, no direct influence can be demonstrated; whereas for chronic conditions the evidence is too meager to say anything decidedly.

B. *The Thyroid Gland*

Crile calls the thyroid "the organ of the emotions" (30, p. 141). Levy and Rothschild call it "the gland of the emotions" (78, p. 991). These investigators apparently call it so from their clinical observations. Truly clinical evidence is more tenable for this gland than for any of the others; and some symptoms of the disease in which the thyroid is involved easily impress one with the belief that it is "the gland of the emotions." Evidence, however, is not plentiful enough to warrant the immediate acceptance of this theory.

We have stated that the acting point of adrenalin is in the main the peripheral neurocellular junction. The location where the thyroid secretion acts is not so obvious. Whether it works directly on the organs, or its activity is mediated and effected through the nervous system is in dispute. Schäfer is one of the advocators of the view that the thyroid has a direct action on the cells of the central nervous system (89, pp. 357, 760).

Pharmacodynamic effects of the thyroid extract or thyroxin of Kendall are differently interpreted by sundry observers and the resulting symptoms are variously stated. Unlike those of adrenalin, they are brought forth with some delay of 24 to 36 hours; and both oral and intravenous introduction produce practically the same

symptoms. In regard to the mental and nervous phenomena in conjunction with the thyroid administration there seem to be few authenticated cases in which even a suggestion of this subject can be found. Schäfer, however, expressed quite clearly his favorite opinion as to the mental effect of the thyroid extract:

"If thyroid extract," he stated, "is administered to a normal individual—the dose varies with the activity of the extract and with the idiosyncrasy of the subject—signs of nervous excitation seen show themselves. There is a feeling of restlessness; the heart beats rapidly and often irregularly; the respirations are fast and shallow; the blood vessels are dilated; the skin is flushed and feels hot; the activity of the sweat-glands is increased; there may be diarrhea. With large doses the psychical excitement is accompanied by hallucinations, and may even simulate mania; there is sleeplessness; tremors of the limbs are common, and the reflexes tend to be exaggerated. In extreme cases there may be exophthalmos and dilated pupils. . . . On ceasing the administration, the symptoms which it has produced subside." (89, p. 357)

These effects he assumed are caused by the action of the thyroid substance or substances on the cells of the central nervous system. It might be supposed that these effects of the thyroid extract on the organs are caused in part by adrenalin, because of their great resemblance to the physical symptoms produced by that substance, and because of many evidences which have proved the adrenalin increase in the blood as the result of thyroid feeding. But according to Schäfer adrenalin plays little part in this connection; although as the consequence of excess of the thyroid substance all the cells—secreting or nervous—being rendered hypersensitive to the action of adrenalin, adrenalin may be responsible for some of the phenomena produced by the thyroid administration. He appears to come to this belief from the fact that with the blood from the exophthalmic patients no appreciable amounts of adrenalin can be tested, and that some of the cases of this disease can be treated successfully by the adrenalin administration (89, p. 369).

If this be true the thyroid substance is capable of producing such remarkable influence on the mental processes as "nervous excitation," "feeling of restlessness." Crile has noted a similar effect of iodine administration on the emotional state. "Excessive administration," he stated, "of iodine often causes a pathologic emotional state which cannot be distinguished from Graves' disease, and in continued overdosage, iodine may even cause Graves' disease." (30, p. 141)

Another group of investigators, however, claim that the thyroid extract never produces nervousness or any mental changes. Among these are Carlson, Rooks and McKie, who performed extensive experiments on various kinds of mammals and birds with thyroid feeding. In the results from the two experiments on man with daily feeding of desiccated sheep's thyroid the distinct effects were (1) loss of weight, and (2) dizziness and weakness, and (3) tachycardia. But "there was no evidence of nervousness, either subjective or objective" (27, p. 156). In one of the above cases the feeding continued 18 days with 1 to 2 gm. of thyroid daily; in the other case for 6 days with 2 gm. a day. Perhaps it might be supposed that the doses are too small to produce any mental effect, but on the last day of the second case 12 grams was fed in one dose and the condition was the same as it was previously. According to these investigators man has a relatively high susceptibility to thyroid administration per ounce, as compared to other mammals and birds, which they tested; and in the first case of the human subject the experiment had to be discontinued because of the subject's dizziness. Apparently susceptible as man is, it seems to be quite difficult to induce any effect on the mental processes.

In the series of experiments the above investigators noted that the carnivorous animals (dog, cat, fox) are more resistant to thyroid feeding than the omnivorous and the herbivorous; and considered that even in them the toxic effects produced are probably not due specifically to the thyroid, but are complicated by the effects of the excessive animal protein diet. If it be so, just what is the toxic agent in the thyroid substance is not fully known, the majority being inclined to attribute it to iodine (10). Whatever it may be, the pharmacodynamic effect is not after all the physiological effect. The latter has partially been shown by the noteworthy experiment carried on by Dr. Cannon, best described in his own words:

"It is a matter of interest to know if continued stimulation of the thyroid would have characteristic effects. This idea had been tested by connecting the central end of the cut phrenic nerve with the peripheral end of the cut cervical sympathetic trunk. This is a union of motor fibers with preganglionic fibers—a combination which Langley long ago proved capable of functioning. When the phrenic neurones grew out to the previous distribution of the destroyed cervical sympathetic axions, they would discharge into the innervated structures a volley of nerve impulses with every respiration. Thus the outlying neurones affecting the thyroid gland, in case the phrenic elements grow into contact with them, would be continuously excited

by normal impulses from the central nervous system. By this procedure we have been able in a certain percentage of cases to produce many of the phenomena of hyperthyroidism. The heart rate, which in the cats is approximately 150 beats per minute, increased to 225 and even to 250 beats per minute. The character of the animals changed from that of quiet, affectionate domestic pets to that of furtive creatures running away from anyone entering the room. There were loose movements of the bowels without evidence of fermentative changes. The most typical alteration, however, was a great increase in metabolism. Removal of the thyroid gland on the operated side in one of the animals restored the metabolic rate, which had been nearly doubled, to a level which was within the normal range of variation." (16, p. 24)

This is an experiment of great importance for many aspects of medical science. Artificial stimulation of the nerve may as a rule have many concomitant results which have no necessary relation with the nerve in question, on account of the surgical operation and of the inevitable involvement of other nerves in the stimulation. And the most unsatisfactory deficiency in the artificial stimulation is in the matter of time; for in an experiment of this nature the duration of the stimulation is limited to a rather short period, which probably might not be enough to compare with the physiological or pathological cases in ordinary life. Cannon's experiments above cited have been able to eliminate these defects to a great extent. So if we admit the results which were thus produced and the interpretation given by him as such, it shows quite obviously; first, that the thyroid is under the control of the cervical nerves; and second, and this is more important for our present purpose, that the thyroid substance thus secreted in an increased amount is responsible for changing the emotional character of the subject. Unfortunately this remarkable experiment suffers from lack of confirmation, many investigators having failed in getting similar results using supposedly the same procedure (107, p. 169).

From the foregoing brief review we may be justified in stating that in the realm of laboratory experimentation, pharmacologic and physiologic, two contradictory views are prevalent, favorable and unfavorable to the thyroidal influence on emotion, each view being supported by evidence of perhaps equal weight.

Clinical observations afford somewhat stronger evidence supporting the view that the thyroid can affect the mental activities. We have already often spoke of Graves' disease as if it were a representative case of hyperthyroidism. It has also been stated that both

the neurogenic and thyrogenic theories of the disease are plausible. Recently, however, an opinion has been advanced by Janney to the effect that Graves' disease is not caused by the hyperfunction of the thyroid, but by dysfunction (55).

Nevertheless, exophthalmic goiter, as we have already stated, is usually taken as an extreme case of Graves' disease or of hyperthyroidism. Let us hear Professor Schäfer:

"In exophthalmic goiter there is strong evidence that the thyroid is in a condition of superactivity. It is true that there is less colloid and probably less thyroxin in its vesicles, but this is what one might expect in an overactive gland, which would be pouring out its secretion into the blood as fast as it is formed—instead of storing it up in the alveoli, as one finds to be the case in endemic goiter." (89, p. 358)

If we take, and it may be safer, exophthalmic goiter or Graves' disease as hyperthyroidism, the first question to be taken up is, "What are the syndromes of the disease, especially those of its mental phase?"

Among other symptoms, Schäfer refers to the mental ones as follows: "There is nervous and psychical excitement and often muscular tremors. . . ." (89, p. 359) He attributes these phenomena to the direct action of the thyroid substance on cells of the central nervous system. The mental symptoms of exophthalmic goiter are probably best presented by C. P. Howard:

"Mental irritability, excitability and restlessness are among the early manifestations. The subjects long for continual changes and must constantly be seeing or doing something new. At times the patient is low spirited and tearful; at others cheerful and smiling but always resents being thwarted or contradicted. Apprehension and anxiety are especially common.

"The moral nature may be so perverted that the patient becomes spiteful, untruthful, suspicious and generally discontented. The intellectual powers may remain unimpaired, but various phobias and obsessions are also frequently noted. Some patients have a morbid exaltation with a capacity for great mental labor. This mental condition is aptly described by the term 'chorea of ideas.' In many cases these early symptoms are diagnosed as either neurasthenia or psychasthenia, and the underlying hyperthyroidism is overlooked. It is a good rule to consider in every case of neurasthenia or mild psychosis the possibility of an underlying hyperthyroidism.

"We are more in agreement with Parhon, Matéesco and Tupa, who consider that the psychic functions are influenced and regulated in a large measure by the activity of the thyroid gland. We would,

therefore, suggest that the mental excitement and unrest at least—possibly even the actual psychosis—may be due directly to the hyperthyroidism." (3, i, pp. 346–347)

From the above quotation it is clear that in hyperthyroidism mental changes of various aspects are common.

In regard to the thyroid relation to the mental disorders, however, the situation is not so clear that we can accept the suggestion of Howard without comment. Evidences are equally strong for both denial and recognition of the close connection between the thyroid and insanity. Some found hypertrophies, while others observed atrophies of the gland in the same type of mental disturbances. Mott has shown the hypothyroidic picture from the post-mortem study of a manic-depressive condition (73, pp. 59–60) and the same is reported recently by Parhon (40, b, p. 215). On the other hand Kappenburg has seen manic-depressive insanity or melancholia among goitrous patients (3, p. 347). A similar contradiction has been met for the other types of insanity. Probably it is too early to say anything conclusively about the correlation which possibly exists between the endocrine glands and mental disorders.

Perhaps none of the other endocrine glands can exceed in their clear-cut effects on the mentality the thyroid gland when it is in a condition of hypofunction. This has been a very well-known fact for a long time and consequently a brief, general account will be sufficient.

The complete surgical removal of the gland is inevitably followed by cretinism in children and myxoedema in adults. Transplantation of the gland—usually the graft is absorbed and decays before long—or the administration of the endocrine extract makes up the deficiency produced by the loss or defect of the gland, at least to so great an extent as to approximate the normal. After citing in detail the symptoms of cretinism given by Falta, Harrow says: "If now there still remains some question as to the soundness of the diagnosis, all doubts are immediately removed by prescribing extracts of the thyroid gland to the young sufferer. The recovery as a consequence is little short of miraculous" (46, p. 19). He probably stated this overemphatically to secure a better hearing. Nevertheless an agreement is reached among the endocrine students that the thyroid therapy almost inevitably brings about at least some temporary improvement of the mental condition of the thyroid defectives, though the effect is less prominent than that on the physical side.

Mott has found the degenerative changes in the nerve cells central and peripheral, in the hypothyroidal patients dying in the asylum (74, p. 52).

Clinical mental pictures of hypothyroidism, cretinism or myxoedema, involves the deficiency of practically the whole mental activity. In the young when the brain development is arrested, idiocy may be complete in the severest case. Mental backwardness may attract the attention of parents or teachers. Dullness, general apathy, sluggishness are apparent. The psychic condition of the cretin is classically described as heavy and listless. In severe cases mental depression is followed by melancholia in older hypothyroid patients. Such are the most frequent type of thyroid defective children, yet another type in certain cases is reported as characterized by nervousness, crying and screaming on slight provocation. Numerous clinical cases are to be found in detail in a monograph by D. W. Fay (41).

Sexual psyche is generally said to be retarded in development with consequent tardiness in appearance of puberty. In serious cases the libido may be entirely lacking.

The relation of hypothyroidism to insanity is not satisfactorily clear. A number of investigations, however, have been reported in the literature. Of 110 cases of post-mortem study of insane subjects Kojima found that the average weight of the thyroid in both male and female is extremely low, as compared with the minimum weight in other than mental cases given by other investigators. In his cases the average weight of the gland in 50 males was 16.46 gm., and in the 60 females 16.87 gm.; while the normal minimum weight by other authors, referred to by him, was 22 to 25 gm. In 12 per cent of males, and in 18 per cent of females of his own cases the thyroid weighed less than 10 gm. (57, p. 22). But it is noteworthy, as we have already noted above, that in many female cases of affective psychosis it was very large (57, p. 37).

Mott seems to believe a manic-depressive condition, associated with mental confusion, hallucination, delusions, "may arise as a result of a particular form of hypothyroidism with the increase of colloid in the pars intermedia of the pituitary body" (73, p. 59). Many investigators have found the thyroid lesion in various types of insanity. Among them the most recent, Lewis, observed histological changes in the endocrine organs of many cases of dementia precox, indicating deficient function; and he believes this is a part of the

underlying cause of insanity (63). Rutherford puts special stress on hypothyroidism, expressing his strong confidence that inheritance of insanity is of purely hypothyroidal nature (84).

H. A. Haynes of the Michigan Institution for the Feebleminded, found that at least one-fifth of the 1,200 cases of feeblemindedness examined gave evidence of disorders of endocrine function, a majority of the cases being due either to hypothyroidism or hypopituitarism (77).

In concluding we may say that for the thyroidal influence upon mental activity and emotion the positive evidence is not satisfactorily advanced; that the negative evidence is more outstanding, the resulting changes in mental status after the thyroidectomy or the extract injection in the defective patients are remarkable. It is desirable to know to what extent the general metabolic variation influences the changes. For the thyroidal effect is most profound on the metabolic rate. More clearcut experiments are needed, however.

C. *The Pituitary Body*

So far no record is available as to the direct pituitary effect on the emotional conditions. The secretion from the anterior lobe chiefly concerns the body growth of the organism, while that from the posterior lobe and probably from the pars intermedia acts very likely as the hormone of the suprarenal and thyroid, this oftentimes is grouped in the same class. Schäfer has shown three actions of pituitrin on the blood vessels different from that of adrenalin (88, pp. 44–46), which, however, need not be quoted here. According to him, aside from these three different actions, pituitrin does not specifically stimulate structures innervated by the sympathetic as does adrenalin. Probably it acts, he says, as a direct stimulus upon the contractile substance of the cells which it influences (88, p. 88).

This mode of action of pituitrin on the organs—direct and not through the nervous fibers—would presumably account for the fact that no report on the results of pituitary feeding has given any appreciable evidence regarding its effect on the nervous system. Muscular tremors are referred to by Dean Lewis (3, i, p. 728) as a nervous manifestation resulting from pituitary extract fed in large doses to young rats. He attributes this effect to the posterior lobe element. This is the only reference so far as I am informed as to the effect of pituitrin on the neuromuscular system; but far from a psychic effect.

The effect of the feeding of anterior lobe on the sexual develop-

ment, reported by Goetsch (3, pp. 729–730) is somewhat promising for our present study. It is true that this promoting effect on sexual development in the animal (rat) only shows the indirect action of the pituitary as it is being brought about as the result of premature development of the internal sexual organs, which, in turn, are stimulated by the hormone; yet it is certainly remarkable that this indirect relation has shown itself in shortening the period of complete sexual development by about one-third of its normal time after only 40 days of feeding.

After a brief review of the hypophysectomies performed by Cushing and by Achner, Lewis summed up the results as follows:

"Experimental removal of the entire hypophysis indicates that the organ is essential to life. Removal of the anterior lobe is the equivalent of total hypophysectomy. The anterior lobe therefore forms the secretion which is indispensable.

"Partial removal or destruction of the anterior lobe in young animals is followed by a peculiar train of symptoms—taking on of fat, genital atrophy, falling of the hair, temporary polyuria and glycosuria, and skeletal changes, which is quite comparable to the changes of dystrophia adiposogenitalis or Fröhlich's syndrome as observed in man.

"Removal of the posterior lobe, in which is included the greater part of the pars intermedia—has no early or late results. . . .

"It has been suggested that many of the changes associated with dystrophia adiposogenitalis are due to interference with or alteration of posterior lobe secretion—which means pars intermedia secretion. There seems to be no experimental evidence to support this claim." (3, i, p. 724.)

This last mentioned opinion, contrary to that hitherto generally accepted, is advocated by many authoritative endocrine students such as Hoskins and Vincent (51, p. 623), (110, p. 318).

The recent work done by Camus and Roussy and by others showed that many of the syndromes usually attributed to the pituitary lesion are really due to damage to the region of the third ventricle. Biedl, however, seems to recognize the pars intermedia as well as the base of the brain as the cause (7).

Cushing describes the results of hypophysectomy in lower animals as adiposis, hypersomnia and sexual dystrophy for adult animals; and the persistent infantile aspect and behavior for those deprived of the gland early in life. These conditions, he says, are those found in human beings afflicted with a corresponding secretory insufficiency due to tumor, anomaly or disease (31, p. 975).

The real cause of acromegaly and giantism is by no means more

clear than that of dystrophia adiposogenitalis. For it has no support from the experimental work in which all attempts to produce the same condition as these diseases by pituitary feeding have not given satisfactory results. At present, however, it is generally believed that these morbid conditions are caused primarily by glandular hyperplasia and functional overactivity of the hypophysis, especially or chiefly of the anterior lobe. The following summary as to pituitary disease given by Tidy gives us clearly the present view:

> Anterior lobe: Overaction, giantism before union of epiphysis; after, acromegaly. Underaction, before puberty, Loraian type of infantilism; after puberty condition unrecognized.
>
> Posterior lobe: Overaction, condition not recognized. Underaction, diabetes insipidus.
>
> Whole gland: Underactivity leads to dystrophia adiposogenitalis, adiposity, genital dystrophy, and infantilism varying in type according to its commencement (before, during, or after puberty). (98, p. 602)

Now we are in a position to see the mental condition in the disease caused by the pituitary disorders with the purpose of appreciating the relationship we are considering. The mental status of adolescent psychoses due to pituitary dysfunction is best described in summarized form by Tucker, a distinguished student, as follows:

> Group 1. Preadolescent hypersecretion with further increased secretion during adolescence. Mental symptoms consist of prejudices and infatuations, increased libido, psychomotor acceleration, transient hallucinations and sudden changes in temperament. These cases are usually diagnosed as hysteria.
>
> Group 2. Preadolescent oversecretion with decreased secretion during adolescence. Mental symptoms consist of indifference, drowsiness and at times trance states.
>
> Group 3. (a) Preadolescent normal secretion with an increase of secretion during adolescence. Mental changes slight, showing overfondness for dress and attention, somewhat increased libido and general nervousness.
>
> (b) Preadolescent normal secretion with a decrease of secretion during adolescence. Mental symptoms consist of dullness, seclusiveness, repetition of movements, inability to express, and irritability; they may or may not have hallucinations. The condition resembles dementia precox (104, p. 261).

Apparently the oversecretion induces abnormally accelerated men-

tal activity, and the undersecretion brings forth the reverse conditions in the case of adolescent psychoses.

This, however, does not seem to be a wholly applicable symptom. For many of the reports characterize the mental conditions of acromegaly with these words, dull, lethargic, indifferent, depressive; or apathy, lassitude, drowsiness, etc., although, according to Cushing, outstanding mental aberrations are rather rare. Only three of the 30 or 40 acromegalies in the series of his cases showed clear mental derangement. All three were hypersensitive women in an acute stage of the disease, and one of them showed a well marked manic-depressive syndrome with ultimate suicide. Truly he regards the syndromes above mentioned as the effect of hypersecretion on the mental processes, and not, as some do, the effect of hypofunction which usually follows acromegalic malady, but he acknowledges the fact that hypopituitarism is accompanied more often by drowsiness and indifference (31, pp. 972-975). Emotional derangement is milder or slighter in hyperpituitarism patients than in defective cases. The latter are sometimes referred to as emotionless and affectionless.

It is worth while to note briefly in this connection the relationship between the pituitary gland and the sexual desire, though it is indirect. We have already referred to the fact that hypophyseal insufficiency is always accompanied by sexual inactivity in structure and function. Goetsch's feeding experiment, above referred to, has further shown that prolonged feeding of anterior lobe extract, 8-9 months, called forth the early awakening of the sexual instincts, along with the premature growth of the sex glands. The breeding activity was more vigorous in every respect in the fed rats than in the control. L. N. Clark's feeding test on chickens is often quoted. After feeding of the pituitary extract for five days the egg production of 35 hens was raised from an average of 18 per diem to 33; at the same time the fertility of the eggs and hatching out of the chicks was extraordinarily enhanced. Apparently the pituitary secretion was in a state of close relationship with the generative glands. Cushing's inference, in view of the fact that the secretory discharges from the pituitary may be elicited from the sympathetic nervous system, that the liberation of the pituitary hormone may account for the recognized effect of the emotions upon the sexual sphere (31, p. 988) is highly suggestive, though we cannot help feeling his overemphasis on this gland.

D. *The Gonads*

(1) The Hypofunction and its effect.

From time immemorial a close connection between sexual gland and emotional life has been practically well known. That castration of the male animal is followed by a great change of the emotional status of the subject is common knowledge; and this has been practised since antiquity for practical purposes. Our present information on this point, unfortunately, is not far beyond the common knowledge.

The physical changes which ensue after castration in both sexes are very remarkable. In lower animals in which the secondary sexual characters are so different between male and female, the effect of castration is seen most strikingly (69, p. 305ff). The male will lose its outstanding token of maleness, such as antlers in the stag, comb and spurs in the cock. If the castration is performed in early life before the secondary characters develop, most of them, if not all, will never appear. Injection of the extract from the testis, on the other hand, arrests the effects of castration and restores the normal sexual appearance (69, pp. 309–310).

It is noteworthy, however, that the condition is remarkably different in the case of the female. The female animal which has its ovary spayed, not only loses its own secondary sexual characters, but male characters make their appearance.

A transplantation of the testicle or the ovary has been performed by many; the effect described has been that the graft, when it is "taken" successfully, acts just like the normal glands, even when it is planted in an abnormal position, as in the kidney or the abdominal wall; hence the function of the gonads as endocrine glands is made obvious. The graft will function (at least for the time before it shrinks) to restore the secondary characters in both sexes or will arrest the development of the opposite sexual characters in the female after the castration.

Recently Lipschütz and his co-workers studied the effect of castration in guinea pigs and found that if one per cent of total testicular substance is left the normal somatic sexual characters will be preserved (64).

From the above statements it is obvious that the somatic secondary characters are dependent upon the endocrine function of the sex glands both in male and female. Now we have to see the gonadal effects on the mental condition.

As might be expected, the closest relation of the generative glands to the mental sphere is made most apparent in the sexual desire. And in the lower animals this desire is most vigorously disclosed in the time of heat or mating season.

A number of experiments are cited by Marshall in which heat disappeared after ovariotomy, and was regained by transplantation of the ovary, in various kinds of animals. Among those he has given an instance of his own experiment collaborated by Jolly, which, because of its deviation from the ordinary one, must be cited. The fresh ovarian extract obtained from femals dogs "on heat" was injected into the other bitch the ovary of which had been previously removed. The anoestrous animal as the result of receiving the injection showed a transient congestion of the external generative organs resembling that of the normal proöestrous condition (**69**, p. 334).

Veterinarians are, it is said, generally agreed that heat does not occur in dogs whose ovaries have been extirpated. Sometimes ovariotomy is practised on mares in order to prevent heat, and consequently to suppress the undesirable symptoms which are liable to render the animals periodically unworkable. For the same purpose, it is very well known, the testicles are usually removed from a stallion.

In cold-blooded animals there is a periodicity in appearance of peculiar somatic changes. Nussbaum's much quoted experiment is of extreme interest in this connection. He found that male frogs from which both testicles have been removed before the copulation period not only do not develop the swelling of the thumb and other somatic changes essential for the prolonged sexual embrace, but show no tendency to seek the female. He has further testified that transplantation of a piece of testis from another frog will restore the normal sexual characters (**89**, p. 352).

Furthermore, according to Schäfer, the injection of testicular substance from mature frogs causes the embrace-reflex to become possible in castrated frogs, and this substance exists in the testicle only during the spawning period, and disappears after spawning is finished (**89**, p. 352). This is highly suggestive. There is no available record regarding the seasonal change in amount of the gonadal secretion for other animals; but, if we are permitted to infer from the above fact that gonads are in a condition of hypersecretion in the sexual season, it would afford additional significance to the gonadal function in relation to the phenomenon of heat. Perhaps

we should go too far beyond the fact if we assumed that we can account for the mental modification usually associated with menstruation in the human female by the same inference.

So far our description has been confined to the lower animals. As it might be expected the present problem is not so clear with respect to the human being. There is, however, a vast accumulation of records as to the results of removal of the gonads.

Castration causes nearly similar effects in man as in animals. The marked masculine characteristics, such as strong skeleton, low voice, beard, etc., are displaced by those of somewhat feminine type. Even the positive feminine signs, such as large pelvis, abundant hair on head and scanty hair in abdomen, etc., are often, not always, observable. When the castration has taken place in early life, the development of the whole genital tract is interfered with.

The sexual desire, it is said, may be extinguished, or it may continue in greater or less degree, the former probably being the case with the early castration. The following case reported by Lespinasse is of great interest for not only the problem at hand but also for many other reasons.

"A man, aged 38, consulted me in January, 1911, to determine if anything could be done for him to compensate for the loss of both testicles. . . . He was unable to have intercourse, which was his chief reason for coming to me. . . .

"On the fourth day after operation (a testicle from a normal man was transplanted in a normal position), the patient had a strong erection accompanied by marked sexual desire. He insisted on leaving the hospital to satisfy this desire. The desire and power of erection continued for five years, since which time I have lost track of him." (3, ii, p. 516)

Lespinasse believes that the sexual libido of eunuchs as a rule is below normal, though the general mental attitude varies greatly.

The general mental characteristics of eunuchs is available in the report of Hikmet and Regnault on the eunuchs of Constantinople, cited by Marshall (69, p. 305, footnote)

"They are avaricious, illogical, obstinate (*i.e.*, cannot change their idea), have no judgment, accept information without proof; are cruel, but fond of children and animals; are faithful in their affections, but have no courage; their mental activity is very slight, and they are extremely fanatical."

Apparently their mental picture is more akin to that of women than of usual normal men.

With regard to the effects resulting from ovariotomy in the human subject, our information is very meager, especially little is known of the case of early extirpation. The only reference in the literature to the effects of early castration in the human female seems to be the much cited one of Roberts, a missionary in the East Indies. According to his observation the early ovariotomy is followed by the disappearance of all sexual characters along with the prevention of the onset of puberty and the occurrence of menstruation. And in certain cases it is said resemblances to men appear. The value of the report is often doubted on the ground of uncertainty of the technique whereby the operation was carried out. But in considering the other reports scattered in the records it may be justifiable to say that early ovariotomy results in the degeneration of the whole genital apparatus and the secondary characters. In some even the opposite sexual signs may appear, beard, *e.g.* A loss of sexual feeling is agreed to be common (3, ii, p. 617).

When complete ovariotomy is carried out in later life, and this is not infrequently performed by gynecologists, the results are not so remarkable as those of the early cases. The cessation of menstruation, atrophy of the genital organs, internal and external, change of the voice to deeper and stronger are said to be the general effects.

Sometimes the appearance of hirsutism after castration has been described—a beard, hairy growth in the mammary and sternal regions (3, ii, p. 618). According to Vincent the sexual desire may not be affected by ovariotomy to any considerable degree, at any rate for some time, although he admitted the difficulty of obtaining exact information on this point (109, p. 304). Emotional disturbances usually follow ovariotomy as it is common at or around the menopause.

So far as the human subject is concerned, the foregoing statements have shown that the gonadal hormones play an important, if not vital, rôle in maintaining the physical sexual characters, and to some extent psychical, specific for each sex. The fact that this is due to the internal secretion of the sex glands did not receive our special attention in the previous discussion. Nevertheless, an incidental statement, made above, that the transplantation of the ovary in the abnormal part of the body of the animal which had been

subjected to ovariotomy will restore the normal "heat," affords an excellent instance of evidence for endocrine function of the ovary. The effect of the injection of the testicle extract which has also been already mentioned gives the same proof for the male glands.

There is heated discussion as to whether this gonadal hormone is elaborated in the germ cells, or, on the other hand, in the so-called interstitial cells. This, however, has no direct concern with our present problem, so reference must be made to the following recent writers—Harms (45), Stieve (96), and Lipschütz (65). The present tendency seems to favor the theory of interstitial cells. The interstitial cells are called by the name of puberty-glands (pubertätsdrüsen) by the Viennese school with Steinach as the leader. An interesting support, and what has a significant connection with our study, is afforded by Dr. Mott. He seems to consider the interstitial cells as the primary stimulus of the sexual desire, for he says:

"Possibly the persistence of the interstitial cells may account for an increased and perverted sexual appetite in old men, due to a stimulation of the desire without the power to perform the sexual act." (75, p. 658)

These statements were made on the basis of histological examination of the testicles from two aged senile dementia patients who died at the age of 85 and 86 respectively.

The Hyperfunction and Its Effect

So far our discussion has been confined to cases of diminished gonadal secretion. Since the gonadal hormone is not yet isolated, the result of extract injection must not be looked upon as identical with that of the endocrine action of the gonads. The well-known experiments of Brown-Séquard are, therefore, of historical significance.

Recently many experiments have been made attempting to call forth hypersecretion of the interstitial cells by the old method of occluding the vas deferens of the male internal genitals. That this operation causes degeneration and disappearance of the spermatozoa, while the interstitial tissue of the organ undergoes hypertrophy, was demonstrated years ago with various animals (69, p. 311). This has been utilized in man and it has been claimed rejuvenescence is attained. The basis is on the presupposition that an increased amount of the hormone is effected by the hypertrophy of the interstitial

tissue. The experiments on rejuvenescence by Steinach were so sensationally reported by newspapers and other periodicals that the ever-desired miracle seemed at last achieved. But, unfortunately, his and similar results by others have not been sufficiently established to command general acceptance.

Clinical symptoms, however, reveal the cases which are traceable to hypersecretion. When this occurs at an early age pubertas precox is the result.

We have already stated that pubertas precox is often associated with adrenal tumor, and that this in fact is the result of hyperfunction of a part originally derived from the testicular element. Many reports of this nature are in the literature. An interesting case of pubertas precox due to testicular tumor is the often quoted one of Sacchi. In a boy about five years of age it was noted that the left testicle began to increase in size. At nine he weighed 97 pounds, had hair on his lip and genitalia; voice deep, penis large, frequent erections, and seminal emissions. A tumor was found in the left testicle and the testicle was removed. Four months afterwards, the hair on the chin had disappeared, that on the upper lip and pubes persisted; the voice became infantile, the penis shrunk, erections, emissions and sexual impulses ceased (3, ii, pp. 350, 505).

An excellent example of a case of probably pure hyperfunction without tumor is reported by Stone (3, ii, p. 506). The parts most relative to our discussion will be quoted. A boy four years old showed the well proportioned muscular and osseous system of a perfectly developed miniature athlete of 21 years of age; abundant hair in the axilla and on the pubes, lumbar and sacral regions, 4 feet and ¼-inch height, weighed nearly 70 pounds; penis of man's size; testicles firm, well-developed, about the average size of an adult's. From the neck down the appearance was that of a perfect man, whilst the head and face were those of a child. The teeth only were deciduous. The boy was lively, and seemed intelligent, though his speech was imperfect, but he could pronounce with facility after his father. He was a little bashful before strangers. His temper was good, but when excited by anger his father alone could manage him, by a knock-down blow.

No sexual action had been known. The following information, however, was obtained from his father, which clearly reveals his sexual desire:

"On the 13th of September he slept with a near relative, a

married lady, the mother of several children. In the middle of the night, she was aroused by finding the boy closely clasped to her back, and her nightdress saturated. She thought he had emptied his bladder upon her, but on carrying her hand to the part, she found that it was saturated with a very different and glutinous material from that she expected."

The boy was extremely fond of embracing the opposite sex, though nothing further had been ascertained (3, ii, pp. 506–508).

Pubertas precox accompanied by tumor in the adrenal cortex is said to be more common in girls than in boys. But these girls, as already mentioned, are in reality cases of virilism, not pubertas precox. The examples of true precocious puberty in girls seem to be limited. One instance, however, is given by Harrow (46, p. 114). A girl of seven had already menstruated a number of times, and had well-developed breasts and pubic hair. A tumor of the ovary was removed, and the girl grew up into normal womanhood. It is greatly to be regretted that a description of her mentality is entirely missing in this case. Presumably it might have paralleled the physical development. (For another example see Biedl 6, p. 257).

From the contrast of the foregoing examples with the results of castration above mentioned we are impressed with the fact that the hormones from the genital glands exert great influence on the mental activity of the human being, especially on the sexual desire or, in more refined terms, the love emotion, which is regarded by the Freudian school as the original driving motor of life, and the fundamental spring of the new life at the period of storm and stress.

The question whether the hormone of the genital gland from each sex has specific power in coloring and maintaining the specific sexual mental characters of the respective sexes may be too delicate to be answered from our meager present knowledge in more than a very limited degree.

The mental characteristics of the eunuchs above mentioned possibly serve as a part of the negative evidence for the present issue. Some positive proof has been furnished by the following experiments.

The effects of the cock's testicular extract on the physical appearance of normal hens are referred to by Marshall (69, p. 312). All male characters are said to have been developed in two hens after daily injection for several months, which returned to the original condition after it was discontinued. Many experiments of this

nature and in transplanting opposite sex glands have entailed similar results.

Recent experiments of Moore are of importance. Gonads from the opposite sex were implanted in the bodies of over 50 guinea pigs of both sexes, which had undergone complete castration at 10 to 20 days of age. Repeated grafts were made in many cases, when necessary. The ovarian grafts in the male led to hypertrophy of the nipples, while the grafts of testicles in the females brought about a remarkable enlargement of the clitoris. The mental characters of the female were so modified that the animals behaved like males: whereas the reverse effect was not observed in the males which retained their normal psychical characteristics (70).

Steinach, Sand and Moore are referred to by Wheelon (3, ii, pp. 458–459) as having made similar experiments. They have shown, contrary to the above results, that castrated males carrying the implanted ovary developed nervous reflexes normally peculiar to the female: " The tail erect reflex, and a kicking, guarding reflex to ward off the male before the appearance of heat. Moreover, they are sought by normal males as though they were females. The mother instinct to protect and nurse the young is also noticeable." No reference is made as to what was the experimental animal, presumably a dog. If so, the so-called female nervous reflexes are not so specific, and the seeking of the male as if it were female is by no means uncommon. " On the other hand, young female rats have been converted into such apparently mature males that they react psychically as males and imitate the normal male in a very exact way in the act of copulation." This accords with the experiment, previously referred to, by Moore.

Further, the combined influence of the male and female gonads produces hermaphrodites. Clinical and surgical reports on this subject are not uncommon. Sand succeeded in producing this artificially. Ovary and testicles were implanted in the abdominal wall of a young castrated male guinea pig on each side respectively. Penis and mammae developed, and milk was secreted from the latter. Psychosexually the animal showed the mixed type; passing in a course of an hour from a mild female to a violent male when put near a male, female or a new born animal (85).

From these observations we may safely say that the gonadal hormone performs a significant rôle in coloring, if not determining and maintaining, the specific sexual characters of the psychical process

as well as the physical one. Schäfer is correct in saying that, in substance, the female is female not only because she produces ova, but because she produces the ovarian secretion; while the male is male not only because he produces spermatozoa, but because he also possesses the testicular hormone (89, p. 351).

Finally, just a word should be mentioned about the nature of the gonadal hormone. On many occasions we have referred to the fact that the ovariotomy tends to develop in the females which have undergone castration the malelike characters, while castration in the male only leads to arrest of the male peculiarities. And, again, implantation and injection of the testicle substance produce in the female the development of male physical characters, and oftentimes even the assumption of the opposite psyche. These facts lead to the prevalent notion that the secondary male characters are normally present in a latent form in the female, and that the ovarian hormone exerts a restraining influence over their development.

This hypothesis seems to get further support since Mott has shown that while no evidence of maturation of germ cells is found in boys before puberty, sections of the ovaries of a female infant aged 18 months show complete Graafian follicles with the endocrine cells surrounding the follicles (72, pp. 10–11; 75, p. 656; 76, p. 283).

E. *The Parathyroid*

While the positive function of the parathyroid gland is rather obscure, the effect of its removal is exceedingly remarkable, especially since it manifests itself in the effect on the nervous system. The symptoms resulting from parathyroidectomy resemble those characterizing an affection common in infancy known as tetany, and accordingly are termed tetania parathyroid priva. These are said to vary in different animals, and in the same animal at different times. They are most severe in carnivorous animals such as dogs and foxes, especially in the young. In these animals the peculiar effects on the nervous system show themselves most clearly in muscular tremors and convulsions of a clonic character, passing eventually into fits, which after many alternating attacks and temporal recovery finally lead to death. Besides these symptoms are many other sympathetic and parasympathetic disturbances—quickened heartbeat, increase of salivation, itchiness of the mouth and lips, rapid breathing, rise of temperature, etc.

In dogs signs of restlessness and anxiety are observed after

parathyroidectomy (MacCallum), whereas in cats, the symptoms which are generally less marked than in dogs, are described as invariably those of depression and sluggishness (Paton and Findlay). These last mental conditions are considered by Paton and Findlay as the inevitable result of the removal of a sufficient amount of parathyroid tissue in various animals such as cats, dogs and monkeys; although the peripheral nerves are increased in their excitability (3, i, p. 529).

These symptoms described above are very remarkable, and it is astonishing that these tiny glands—one of the smallest independent organs of the body, collectively not weighing more than two grams with all four (very often 3, 2, or even only one is found in the human subject, see Kojima, **57**, p. 23)—should produce so serious a train of affects. And the results are thought to be elicited from the effect on the central nervous system, especially on the spinal nerves. The reason for the production of these symptoms is now generally believed to be the result of removal of antitoxic substance which the parathyroid normally furnishes to the blood.

Mechanism and Hygiene of Emotion

1. *Neuro-endocrine Mechanism of Emotion*

In strong emotion the entire sympathetic realm is called into action, and the parasympathetic innervation is suppressed. In anger, for example, the pupil is dilated, the heart-beat accelerated, the respiration quickened, blood pressure raised, hair erected, sweat profuse, the whole alimentary and genital activity checked, and the muscles tremble. Of course these striking somatic changes are all capable of being brought about by nervous action alone, but the previously mentioned facts show quite clearly that the endocrine substances play a significant part in these bodily changes reinforcing and prolongating the nervous operation. Thus chemical substances from adrenal (**35**), thyroid, and pituitary, act on the organism just as the sympathetic system does. Further, adrenalin is said to hasten blood-clotting and to abolish the effect of muscular fatigue (**14**). Recently pituitrin is claimed to have the latter effect (**106**). Increment of blood-sugar and subsequent glycosuria are known to be elicited by adrenalin, thyroid extract and perhaps by pituitrin. It is obvious, then, that some of the hormones reinforce nervous action in bringing about enormous bodily changes in time of great emotion. Some of the changes, pupil dilatation, etc., appear after a latent

period and persist after nervous stimulation has stopped. Coöperation of hormone with the nerve is presumable. The so-called post-emotional state or mood may be partially ascribed to the persisting hormonic action.

How is the neuro-endocrine mechanism operated when emotional agitation occurs? This is an extremely difficult question. The nervous center for emotional expression, mainly mimetic, is alleged by many investigators to exist in some part of the diencephalon (49, 81, 82, 92, 118). What relation this part of the brain has with the endocrine activities we do not know.

We know that the emotional expressions are not limited to the facial ones, that there are other grosser bodily changes, and that these others are activated predominantly by the sympathetic nervous system. Though the location of the sympathetic center is yet obscure, Edinger, Karplus and Kriedl describe it as lying in some point of the mid-brain (3, i, p. 162).

On the other hand, the reflex center whereby the adrenal secretion is controlled is determined by Elliot to exist in some part of the medulla oblongata, in the "neighborhood of the vasomotor center which governs other sympathetic musculature" (36, p. 407). Recently Cannon and Rapport came to the conclusion, from their elaborate experiments, that the reflex center for adrenal secretion is located immediately back of the corpora quadrigemina in the floor of the fourth ventricle (22, p. 34). Both experiments above referred to indicate that the reflex center of the adrenal body is somewhere in the mid-brain.

It is very suggestive for our present work to note that both the sympathetic center and the reflex center for the adrenal secretion are assigned to the mid-brain. More so, when we take into account, on the one hand, the facts that glycosuria is experimentally caused by puncture of the floor of the fourth ventricle, and that polyuria is supposed to have its center in the mid-brain; on the other hand, the fact that these phenomena appear with the emotional stress. Presumably the emotion arouses the endocrines directly through their nervous centers, and these centers lie in nearly the same area of the brain. Thus the normal emotional process is brought about and maintains itself through the neuro-endocrine mechanism.

2. Hygiene of Emotion

Emotion, as the name suggests, is agitation, or better, disintegrative or disruptive in nature. When it becomes intensive enough

the neuro-endocrine system is first mobilized and then the whole musculature. The whole organism is selectively prepared for ensuing bodily action. The activity of the alimentary canal is temporarily stopped, the blood is transferred from this part to the limbs, adrenalin increased and sugar called forth from the liver, the thyroid becomes more active, and the metabolic rate is heightened. In a word, emotion tends to provide the complete bodily condition to meet an emergency. It may be compared to the function of inflammation of organic tissue or to the military mobilization of the nation. The final aim is to restore the welfare of the organism or of the country. But the mobilization in case of emotion or of military power always means abnormality and disturbance. Like a nation after a war, the organism after an emotional storm becomes weak and exhausted. The so-called war-disease or war-psychosis is a concrete extreme example which illustrates the neuro-endocrine exhaustion after the overstimulation of emotion.

The continuous stimulation of strong emotion such as anger and fear will result in adrenal exhaustion and consequently in the overwork of the liver and thyroid and perhaps the pituitary. And the result of the overstimulation of the endocrines is evident from the previous statement. Cannon's experiment, performed on cats producing the symptoms of hyperthyroidism by connecting the secretory nerve of the thyroid with the phrenic nerve, should be recalled here. Emotional hyperglycosuria in man and animals, and the artificial hyperglycosuria produced by injection of adrenalin or the extract of the thyroid or pituitary, suggest the possible evil result of the prolonged emotional strain. Indigestion accompanying strong emotions is a no less important symptom, popularly known and experimentally proved, and often pointed out as a cause of various mental disorders.

Hammett's recent work is interesting in this connection. Parathyroids of the albino rats from two stocks, one tamed and gentle, the other untamed and hypertensive, were extirpated. The ratio of mortality after two days of the operation was studied with each stock. The percentage of mortality of the tamed was 13 and that of the other group, 76. "This definitely showed," says Hammett, "that the stability of the nervous system is a strong factor in the resistance of albino rats to the loss of the parathyroid secretion" (44, p. 201). The cause of the high mortality in the group of the emotional rats, as he called them, was ascribed to the "greater tendency to the formation of toxic compounds than is found in those rats of low

muscular tone." If we accept this explanation, hyperactivity of emotion causes a large production of toxic substances; and over-function of the parathyroid is naturally demanded. The unhealthy influence of hypertension on the gland and thus on the whole organism, even if parathyroidectomy is not performed, is not hard to be seen.

The undesirable effect of strong emotion is not restricted to that on the somatic economy, but the mental activity is also affected, temporarily or permanently. Psychiatrists can tell of numberless cases of insanity caused by or at least related to the emotional story; the temporary "craziness" aroused by emotion is too well known to be mentioned.

Sexual emotion is very important in this connection. The exact neuro-endocrine mechanism of emotion regarding the gonads is obscure. The age of onset of various psychoses tells the important relation of the gonads to mental hygiene, especially the hygiene of emotion. Degenerative changes in the gland of dementia precox patients, both male and female, are found noted as an etiological factor by many authorities like Tiffany (99), Mott (76), and Abderhalden (40, a). The theory is still in dispute, but it suggests the close connection between the disease and these glands.

So far we have discussed only the unfavorable result of over-stimulation of emotion. But understimulation of emotion is equally bad. The Freudian school strongly teaches us the morbid result of suppression of emotion. Emotion may be luxurious, as some say. Daily work may be duly performed in our community without a bit of emotion, as our life could be maintained on tasteless but chemically perfect foodstuff. But how miserable life would be! Normally the whole mental activity is more or less colored by an affective tone. Repression of normal emotion means a colorless mental world. We have mentioned the glycosuria accompanying depression of emotion.

We have seen that pleasant emotion is favorable to digestion. This is of great significance as regards mental hygiene. Very often indigestion causes various psychoses. The cessation of the digestive function in the case of strong emotion through the neuro-endocrine mechanism, above mentioned, has great importance in relation to the hygiene of emotion. Recently Dr. Cannon came to the conclusion as the result of his experiments, that the inhibitory nerve for the adrenal secretion is the vagus, and the center of it is in the mid-brain, nearly the same as the excitatory center (22). This is a very impor-

tant contribution. We know that the vagus is the secretory nerve for the salivary, gastric, and pancreatic glands (12, 79); in other words, the action of the vagus is favorable for food digestion. Thus, it may be stated considering the above that pleasant emotion stimulates the vagus nerve, producing a favorable condition for bodily construction, and it inhibits the adrenal secretion, thus checking a condition destructive for the organism. Looking upon emotion in its relation to digestion, it is evident, therefore, that pleasant emotions are healthful, and strong emotions, like fear, anger, are injurious. This holds true not only of the digestive function but also of the other bodily activities; and, further, for the mental health.

However, it should not be forgotten that even pleasurable emotion is unwholesome when it becomes too strong, as is shown by an example cited by Cannon (14, p. 277) and by our daily experience. Virtually fear and anger protect the organism not only in the natural life of the animal kingdom, but also in the human life of civilized society, if experienced in a mild degree. We can agree with Dr. Burnham when he postulates the principle of hygiene in the following words: "The maintenance of an optimum stimulation and reaction" (9, p. 365). "To maintain a condition of healthful function," he says elsewhere, "it is necessary to keep stimulation and response within certain limits; overstimulation, understimulation, overreaction, and lack of reaction, are alike injurious to health" (9, p. 330).

Certain endocrinologists attempt to associate a specific emotion with a special ductless gland—pituitary with fear anxiety; adrenal with courage, for example. It would be a great invention if we found the way to regulate a man's particular emotion and his character by extract administration, transplantation, or partial removal of the endocrines. All the endocrines, however, like other organs, are complexly interrelated with one another in their function; and accordingly in their relation to the mental activity there exists also an intricate correlation. We can hardly attach any specific emotion to a specific endocrine; and so the regulation of the emotional activity is only possible through lowering or heightening of the mentality as a whole; as is seen in the case of thyroidal administration to cretins. The only way to control a specific emotion so as to maintain mental and somatic health is to control the stimulation of the emotion, by biologically adequate stimuli or by individually acquired conditioned stimuli. For the details of the practical method another study is required.

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NOTES AND NEWS

Dr. Walter S. Hunter has resigned as professor of psychology at the University of Kansas to take the G. Stanley Hall Chair of Genetic Psychology at Clark University.

The death is announced of George Stuart Fullerton on March 23.

At Syracuse University, Dr. Hulsey Cason has been promoted from assistant professor to associate professor of psychology.

Dr. Homer Bishop, instructor in psychology at Cornell University, has been appointed assistant professor of psychology at Smith College.

Drs. Grace M. Fernald and Shepherd Ivory Franz, of the Department of Psychology, University of California, Southern Branch, Los Angeles, have organized an experimental school for speech and motor defects, and for limited children, especially the so-called mentally blind who seem unable to learn to read or spell. With Drs. Kate Gordon and Ellen B. Sullivan, they have also organized an out-patient clinic at the Children's Hospital, Hollywood, for psychological testing and for speech and motor training.

Professor W. W. Charters, of the University of Pittsburgh, has been appointed professor of education in the University of Chicago.

James Ward, professor of mental philosophy at Cambridge University, died on March 4, aged eighty-two years.

Dr. Paul S. Achilles has been appointed field representative and assistant to the director of the Personnel Research Federation, New York City.

On February 1–3, commemorative exercises and conferences in genetic psychology were held at Clark University in memory of G. Stanley Hall and E. C. Sanford.

Vol. 22, No. 5 May, 1925

THE PSYCHOLOGICAL BULLETIN

1. GENERAL

364. Schultze, F. E. O., Anleitung zur Menschenkenntnis. *Wissenschaft und Bildung,* 1923, **189**, 170 S.

Das Buch bleibt nicht an der Oberfläche, sondern dringt mit Gründlichkeit bis zu den Vererhungsfragen durch, führt freimütig manchen auf Gewohnheit zurück, was wir gern in sentimentalem Lichte sehen, und versucht sogar, in der Stellung zum Welt- und Lebensganzen der Philosophie dieselbe Berechtigung zu sichern wie der Religion. Es stellt nicht Einzeltypen auf und will nicht ein Nachschlagebuch mit Stichwörtern sein, sondern weist nur überall auf die verschiedenen Beobachtungsmöglichkeiten hin an der Hand von 4 Hauptfragen: Welche Stellung nimmt der Mensch ein zur Natur, zu den Mitmenschen, zum Welt- und Lebensganzen und zu sich selbst? H. Keller.

365. Messer, A., Kant als Erzieher. *Päd. Mag.,* 1924, **994**, 25.

Das Kantjubiläum hat in Wort und Werk zu einer Renaissance des grossen Philosophen geführt. In knapper Übersicht entrollt V. ein Bild von ihm als Hauslehrer und akademischer Lehrer unter Ausblick auf seine Stellungnahme zur Pädagogik seiner Zeit und entwikkelt die erzieherischen Momente in seiner Art und seiner Lehre: die interlektuelle Redlichkeit und Sachlichkeit, seine kritische Art und Zuverlässigkeit. Besonders sei seine Grundanschauung, die an die Freiheit und Würde des Menschen und seiner idealen Aufgaben und Pflichten appelliere, angetan auch in der Gegenwart zur Volks- und zur Völkerversöhnung beizutragen. F. W. Schroeder.

366. Dürckheim, K. v., Erlebensformen. Ansatz zu einer analytischen Situationspsychologie. Ein Beitrag zur Psychologie des Erlebens. *Arch. f. d. ges. Psychol.*, 1924, **46**, 262–350.

Es wird versucht, auf analytischem Wege methodische Grundlagen für das Verstehen des Erlebens des entwickelten Menschen zu schaffen, soweit dies rational auflösbar ist. Das Erfassen des Erlebens in seinem aktuellen Ablauf steht im Vordergrund, die Frage nach seinen funktionalen Grundlagen tritt zurück. Zunächst werden an konkreten Beispielen die für alle Erlebenspsychologie grundlegenden Begriffe: "Gegenstand," "Reaktion," "Situation," "Erlebnis" gewonnen; sodann mit Hülfe dieser Grundbegriffe andersgeartete Kategorien: "Erlebensformen" beschreibend entwickelt, deren besonderer Strukturtypus in den Formen des anschauenden," "analytischen," und "zielstrebigen" Erlebens erfasst wird. Es geschieht dies in der beschreibenden Analysis typischer Zusammenhänge bestimmter Gegenstands- mit bestimmten Reaktionsformen. Hierbei zeigt sich zugleich die Bedeutung der gewonnenen "Erlebensformen" für das Verständnis einzelner konkreter Reaktionen. von Dürckheim.

367. Ford, A., Recording Apparatus: the Electro-Kymograph. *J. of Exper. Psychol.*, 1924, **7**, 157–163.

The writer describes the operation of a recording apparatus which can take records for long intervals and which eliminates many of the poor features of the older kymographs. C. C. Pratt (Harvard).

368. Thorndike, E. L., The Influence of the Chance Imperfections of Measures upon the Relation of Initial Score to Gain or Loss. *J. of Exper. Psychol.*, 1924, **7**, 225–232.

In the present article Professor Thorndike shows why it is better, when scoring individuals in a varying group who have been measured twice with respect to some ability by an imperfect measure, to correlate not against initial ability, but against the average of initial and final ability. C. C. Pratt (Harvard).

369. Thomson, G. H., A Formula to Correct for the Effect of Errors on the Correlation of Initial Values with Gains. *J. of Exper. Psychol.*, 1924, **7**, 321–324.

Because of errors of measurement there appears to be a negative correlation between an initial value of some mental function and its

gain over a certain period in case there is no *real* correlation. In the present article the writer gives a formula to correct for the effect of such errors of measurement. C. C. Pratt (Harvard).

370. Spearman, C., and Holzinger, K., The Sampling Error in the Theory of Two Factors. *Brit. J. of Psychol.*, 1924, **15**, 17–19.

This paper proposes to make available for use the correct criterion for analyzing experimental data to see how far it conforms to the theory of "Two Factors." J. E. Anderson (Yale).

371. Jones, W., A Note on the Correlations of Sums. *Brit. J. of Psychol.*, 1924, **15**, 18–22. J. E. Anderson (Yale).

372. Sanford, E. C., Granville Stanley Hall 1846–1924. *Amer. J. of Psychol.*, 1924, **35**, 313–321. G. J. Rich (Chicago, Ill.).

373. Urban, F. M., On the Theory of Errors of Observation. *Amer. J. of Psychol.*, 1924, **35**, 322–331.

The various derivations of the method of least squares as a device for the adjustment of errors of observation, although the steps in the deductions are sound, start from untenable hypotheses. The difficulty lies in part in the fact that the idea of precision of measurement is foreign to the principles of abstract mathematics, which is concerned with quantities which are precisely defined and absolutely exact. Felix Klein has shown that in all (physical) measurements there is a margin or interval within which all values of the standard of measurement appear equal to the unknown quantity. This margin is determined by the accuracy of our sense-organs and the quality of our instruments of measurement. It is customary to take the center of this margin, the mean of its upper and lower limits, as the value of the quantity to be measured. The margin corresponds to the interval of uncertainty of psychophysics and the central value to the point of subjective equality, while the process used to determine the upper and lower limits of the margin is identical with the one followed in the method of least perceptible differences. The coincidence of the point of subjective equality with the center of the interval of uncertainty has been found empirically. In so far as the conditions of psychophysical experimentation and physical measurement coincide, this empirical result aids in the justification of the use of the method of least squares in the theory of errors. The notion of

accuracy used in psychophysics is identical with the notion of precision used in the theory of errors of observation. G. J. Rich (Chicago, Ill.)

374. Humphrey, G., The Theory of Einstein and the *Gestalt-Psychologie:* A Parallel. *Amer. J. of Psychol.,* 1924, **35**, 353–359.

"In the fields of physical and psychological science there have lately appeared, under the names of Einstein and the *Gestalt* theories, innovations which, unnoticed, at least in print, by both sets of workers, appear to lead by fundamentally similar methods to fundamentally similar conclusions. In each case the attack is headed against an older theory whose postulate is discreteness of data, implying the necessity of a relative rather than an absolute treatment. This common point of view results in parallelism, of which examples are the nonadditiveness of data and the insistence upon whole processes rather than parts." G. J. Rich (Chicago, Ill.).

375. Wallis, W. D., Does Behaviorism Imply Mechanism? *Amer. J. of Psychol.,* 1924, **35**, 387–395.

Behaviorism takes a new view of old situations and aims to furnish for previously incommensurable things, objective and subjective, a common denominator in terms of which all may be compared. But in so doing it does not abolish the differences. It states them in a form in which comparisons may be made. The behavior of living things by variant reaction to similar situations and by the fulfilling of a will to live sets them apart from machines and from material bodies. Purpose must be read into actions in order to get it out of them; its utility as a device for anticipating behavior is its justification. The reality of the purpose is independent of knowledge of it by the agent. G. J. Rich (Chicago, Ill.).

376. Ruckmick, C. A., A Bibliography of Rhythm (Third Supplementary List). *Amer. J. of Psychol.,* 1924, **35**, 407–413. G. J. Rich (Chicago, Ill.).

377. Puglisi, M., Franz Brentano: A Biographical Sketch. *Amer. J. of Psychol.,* 1924, **35**, 414–419. G. J. Rich, (Chicago, Ill.).

378. Terman, L. M., The American Psychological Association. *Science,* 1924, **59**, 546–548. G. J. Rich (Chicago, Ill.).

379. Ritter, W. E., What Is the Larger Meaning of the Vitamine Type of Action? *Science,* 1924, **60**, 214–214.

Discoveries concerning the action of vitamines and hormones lead to the conclusion that living organisms have no power to utilize physiologically the potential energies of their own bodies or of substances ingested by them, except through the activation of these energies by substances more or less of the vitaminic type or by changes of external conditions of some kind. In the field of psychobiology, the phenomenon of stimulus and response is of the same type. This phenomenon plays a basic part in all life. G. J. Rich (Chicago, Ill.).

2. NERVOUS SYSTEM

380. Bárány, R., und Vogt, C. und U., Zur reizphysiologischen Analyse der kortikalen Augenbewegungen. *J. f. Neurol. u. Psychol.,* 1924, **30**, 87.

Die an 6 Macacen vorgenommenen Experimentelle sellen in Bezug auf die Augenbewegungen reizphysiologische Unterschiede zwischen den verschieden leicht erregbaren Kortexzentren für Bewegungen der Augen aufdekken. Geachtet wurde insbesondere auf Differenzen im Reaktionsablauf, auf die Möglichkeit, durch Reizung der verschiedenen kortikalen Augenfelder etwa die durch Exstirpation verschiedener kortikaler Augenfelder bedingten Deviation, Nystagmus zu modificieren, endlich auf die Beeinflussung des kalorischen Nystagmus durch Reizung der verschiedenen Rindenfelder. Grundsätzlich kam man zu dem Resultat, dass die Verschiedenheiten der Augenbewegungen architektonischen Differenzen parallel gehen. W. Riese (Frankfurt a/M.).

381. Barenne, J. G. D. de, and Burger, G. C. E., A Method for the Graphic Registration of Oxygen Consumption and Carbon Dioxide Output; the Respiratory Exchange in Decerebrate Rigidity. *J. of Physiol.,* 1924, **59**, 17–29. L. T. Spencer (Yale).

382. Barenne, J. G. D. de, Experimental Researches on Sensory Localization in the Cerebral Cortex of the Monkey (Macacus). *Proc. Roy. Soc.,* 1924, **B96**, 272–291.

By the method of local strychninization using a 3 per cent solution hyperesthesias and hyperalgesias were obtained. Various sensory

areas were defined. It was established that sensory disturbances occurred when the precentral cortex, which includes the "motor" area, was subjected to strychninization at different points. Disturbances occurred in the deep sensitivity as well as in cutaneous sensitivity. Disturbances homolateral to the poisoning were observed, especially of cutaneous sensitivity, but were of less intensity. L. T. SPENCER (Yale).

383. STETSON, R. H., The Hair Follicle. *Psychol. Mono.*, 1923, **32**, No. 3, 1–17.

Operations, by a new technique, on hair follicles of the scrotum give evidence that the "hair sensation" results from the compression of the upper innervation of the follicle and from the deformation of the skin surface at the point of emergence of the hair. Hair follicles are found to be not essential to any variety of pressure or touch sensation. L. A. PECHSTEIN (University of Cincinnati).

3. SENSATION AND PERCEPTION

384. BLUNCK, E., Psychologische Beiträge zur Frage der Behandlung des Raumes in der ägyptischen Flachkunst und Plastik. *Arch. f. d. ges. Psychol.*, 1924, **47**, 301–392.

Von einer analytischen psychologischen Theorie des Raumsehens (Wittmann) aus wird die ägyptische Kunst (Beuroner, Worringer, Cöllen, Fechheimer) behandelt. Sie zeigt, im Zusammenhang mit dem ägyptischen Geistesleben (Kultus) betrachtet, in Verwendung, Weiterbildung der Darstellungsformen Züge einer "primitiven" Kunst. Die orthogonal vorgestellten Einzelgesamtbilder verbindend und individualisierend erreicht sie Einheiten in Fläche und Raum, ohne zur geschlossensten (perspektivischen) Einheitsauffassung und Darstellung zu gelangen: fehlende Einheitsbeziehung, Körpereinheit, Nebeneinander, Überschneidungen, "Umklappungen," Übereinander, Perspektive, Hintergrund, Grössenunterschiede, Handlungsdarstellungen, Typisierung. Aufbau der Plastiken, Gesetz der Frontalität, Überschneidungen, Grüppenbildung, Individualisierung der Teilbilder (Porträtähnlichkeit). Das künstlerische in der Darstellung trotz relativ primitiver Formen. Aufgabe ist es, diese Kunstwerke aus immanenten (psychologischen) Prinzipien zu erfassen. WITTMANN (Kiel).

385. SCHINDLBECK, J., Über die Erscheinungsweisen des im Bilde dargestellten Raumes. *Arch. f. d. ges. Psychol.*, 1924, **47**, 393–427.

Die Arbeit ist ein Beitrag zu einer analytischen Theorie des Raumsehens. Sie gibt eine Analyse der Struktur des Sehraumes, wie er durch bedeutungsvolle Sehdinge bestimmt im Bilde zur Auffassung kommt. Die objektiven und subjektiven Bedingungen der Erscheinungsweise des Bildraumes (Darstellungsmittel, Linie, Farbe, Hell-Dunkel, Perspektive, Auffassungsweisen) werden untersucht. Je nach Richtung der Beachtung baut sich der Bildraum auf. Besonders wichtig ist die Beziehung zwischen Teilbild und Gesamtbild. Der Umfang des Beachteten ist ausschlaggebend für die erste Differentzierung der komplexen Wahrnehmungsinhalte, wie für die endgültige sinnvolle Bildraumvorstellung. Im Prozess des Aufbaues sind die perzeptiven, apperzeptiven und reproduktiven Momente unterschieden. WITTMANN (Kiel).

386. WITTMANN, J., Raum, Zeit und Wirklichkeit. *Arch. f. d. ges. Psychol.*, 1924, **47**, 428–511.

Die Analyse des Vorstellungslebens des Erblindeten (Ahlmann, *Arch. f. d. ges. Psychol.*, **46**) sowie operierter Blinder (Uhthoff) ergibt, dass (ohne optische Perzeptionen) akustisch-taktil-motorisch (James, Heller, Steinberg) kein Raumbewusstsein gegeben ist (Platner, Hagen, Gelb, Goldstein). Das "Herumbewusstsein" des Blinden ist ein qualitatives dynamisches Erlebnis. Bezugnehmend auf Kants Lehre wird der "Sehraum" als apriorische Form der Anschauung (Kategorie im Aristotelischen Sinne der optisch erfahrbaren Wirklichkeit) dargetan. Vom Standpunkte einer analytischen Psychologie aus werden die Begriffe "Perzeption," "Apperzeption" neu gefasst, das Verhältnis von Sehraum zu objektivem Raum, von Anschauung zu Geometrie erörtert. Bezugnehmend auf die Erlebnisse des Blinden, auf Augustins Betrachtungen, auf neuere psychologische Untersuchungen (Vierordt u.a.) wird die Zeit als apperzeptive Ordnung der Perzepzionen (ev. symbolisiert durch geometrische Konstruktionen), insofern als Kategorie der Wirklichkeit dargetan. WITTMANN (Kiel).

387. GRABKE, H., Über die Grösse der Sehdinge im binokularen Sehraum bei ihrem Auftreten im Zusammenhang miteinander. *Arch. f. d. ges. Psychol.*, 1924, **47**, 238–300.

Die historische Analyse des Problems (Fechner, Martius, Holtz-Hillebrand, v. Sterneck, Poppelreuter-Schumann, v. Aster, Jaensch,

Blumenfeld) ergibt zwecks Klärung der objektiven und subjektiven Einflüsse (Netzhautbildgrösse, absolute, relative Grösse, Blickrichtung, Helligkeit, seitlicher Abstand, Kontrast, Querdisparation, Sehferne, Gestaltauffassung, Vorhandensein anderer Sehdinge, Überschaubarkeit, Aufmerksamkeitswanderung, Auffassungsform) auf die Sehgrösse als Aufgabe, die Grösse der Sehdinge in Abhängigkeit von ihrem isolierten oder vereinten Auftreten bezw. Aufgefasstwerden experimentell zu untersuchen. Mit 4 Versuchsanordnungen, 22 Versuchspersonen ergibt sich in langen Versuchsreihen, dass die Grössenverhältnisse im binokularen Sehraum recht labil sind, dass diese Labilität wesentlich von der Beachtung abhängt. Diese kann isolierend oder beziehend sein; letztere von angebbaren objektiven Bedingungen abhängig, führt zu bestimmten Einordnungen der Sehdinge (Sehdingschichten), denen bestimmte Grössen der Sehdinge und Sehfernen entsprechen. WITTMANN (Kiel).

388. PETERMANN, B., Über die Bedeutung der Auffassungsbedingungen für die Tiefen- und Raumwahrnehmung. Eine experimentelle Untersuchung. *Arch f. d. ges. Psychol.*, 1924, **46**, 351–416.

Die Tiefenordnung der Sehdinge erweist sich abhängig von ihrem reizmässig und auffassungsmässig bedingten Zusammen. Mittels gestaffelter, beliebig beleuchtbarer Kulissen im erfahrungsfreien Dunkelraum wird ein mannigfaltig differenzierbarer Anblick der Sehdinge (beliebig beleuchtbarer Kreisscheiben) in jeweils neuen Sehräumen ermöglicht. Durch die Kulissenmethode lassen sich in angebbarer Abhängigkeit von den Reizbverhältnissen und der Auffassung Sehräume aufbauen; der Aufbau vollzieht sich charakteristisch in "Sehdingschichten" auf rein perzeptive (analytisch-synthetisch perzepztive) Weise. Einzelsehding und Gesamtsehraum bedingen sich wechselseitig. Es zeigt sich für das monokulare wie binokulare Sehen das beziehliche (isolierende, kollektive) Auffassen als bestimmend. Die Reizverhältnisse (objektiven Tiefen "motive," Helligkeit, Gestalt, Netzhautbildgrösse) haben Bedeutung für das Tiefensehen, sofern sie die Richtung des beziehlichen Auffassens anregen. PETERMANN (Kiel).

389. VOGELSANG, K., Der Einfluss der Dunkeladaption auf den zeitlichen Verlauf der Gesichtsempfindung bei Verwendung farbiger Prüflichter. *Arch. f. d. ges. Physiol.*, 1924, **203**, 1.

Untersuchung der Dunkeladaption nach den *Fröhlich-Covács*'schen Verfahren ergab eine Abnahme der Empfindungszeit für alle Farben.

In einem gewissen Stadium der Adaption wird diese Abnahme für Weiss durch ein kurzes Ansteigen unterbrochen. Bei Blau tritt dieses "kritische Stadium" früher ein und ist schächer entwickelt, während für beide untersuchten Rot (bis 703$\mu\mu$ und 587$\mu\mu$) der Wideransteig später einsetzt stärker ausgeprägt ist als bei Weiss. Während des kritischen Stadiums erleidet die Empfindungsdauer eine erhebliche Zunahme, deren Endwerte für Rot wesentlich, für Weiss etwas grösser sind als am helladaptierten Auge; bei Blau tritt in der Regel eine Abnahme der Empfindungsdauer gegenüber den Anfangswerten ein. Die beobachteten Erscheinungen werden auf ein einheitliches Funktionieren der nervösen Zentren zurückgeführt, wobei allerdings beim Tagessehen ein Überwiegen des Zapfenapparates, beim Dämmersehen ein solches des Stäbchenapparates angenommen wird. E. Fischer (Frankfurt a/M.).

390. Gellhorn, E., Beiträge zur Physiologie des optischen Raumsinnes. *Arch. f. d. ges. Physiol.*, 1924, **203**, 186–198.

Nach früheren Mitteilungen über Einstellung von Parallelen, die in einer zur Versuchsperson frontalen bezw. einer zur Frontalebene um 45° geneigten Ebene lagen, berichtet Verfasser jetzt über Feststellung der Genauigkeit des Parallelitätseindruckes und die möglichen Ursachen bei tiefenparallelen Strecken. Drei Versuchsreihen: Bei der ersten variieren die Winkel der tiefenparallelen Stäbe mit der Sagittalebene. Bei der zweiten ist ein Stab um die Horizontale geneigt. Der zweite Stab muss auf gleiche Neigung eingestellt und dadurch auch die scheinbare Lage des ersten im Raum charakterisiert werden. In der dritten Versuchsreihe: Kombination der ersten und zweiten, um die Fehler bei der Einstellung eines Stabes in eine beliebige Raumlage zu bestimmen. Happel (Frankfurt a/M.).

391. Szeliski, V. v., Relation Between the Quantity Perceived and the Time of Perception. *J. of Exper. Psychol.*, 1924, **7**, 135–147.

The experimental procedure in this investigation consisted essentially in presenting to six subjects small dots and figures printed on white cards in an Ach card-changer. The task was to name the number of dots or figures present in every exposure. The results indicate that the time of perception increases as the number of objects increases, even when eye movement is eliminated. Wundt's conclusion that perception is an unitary act which can grasp so much and

no more, and which can take in "a spatial idea . . . when it has only a limited extent . . . at once in its totality" therefore requires modification. Perception is *continuous*. C. C. PRATT (Harvard).

392. LAIRD, D. A., Studies Relating to the Problem of Binocular Summation. *J. of Exper. Psychol.*, 1924, 7, 276–290.

This experiment was devised to throw some light on the problem of binocular summation. An apparatus was constructed for either monocular or binocular presentation to the observer of Lovibond tintometer color slides. With this apparatus monocular and binocular *RL's* and *DL's* for color were secured and their values compared. In the binocular *RL* for red there was a reduction of 31.3 per cent in the value of the stimulus as compared with the stimulus for the monocular *RL*, photopic vision; a reduction of 21.1 per cent, scotopic vision; a reduction of 23.5 per cent for binocular *DL*, photopic vision; and 28 per cent, scotopic vision. If summation were unimpaired, the reduction should be 50 per cent. Only in one series of experiments with scotopic vision, when there was only one opening in the stimuli objectives, was it possible to secure unimpaired summation. In this instance the reduction in the value of the stimulus was 58.6 per cent. It appears that in photopic vision, if not in scotopic, the response to binocular stimuli is selective rather than summative. C. C. PRATT (Harvard).

393. Fox, C., Study in Preperception. *Brit. J. of Psychol.*, 1924, 15, 1–16.

Two similar groups of students were shown lantern slides of armor, one group having had a lecture upon it, the other having not, and asked to write down all the details they recalled. No positive results were obtained. In a second experiment the lecture was repeated twice and the technical terms learned, with inconclusive results. In the third and final set of results, the students were divided into two groups on the basis of a preliminary test; then one group was given the lecture twice, then students being permitted to copy terms in their notebooks and to ask questions. The groups were then recombined and given the final tests. The figures show that as a result of preperception the trained group is able to observe somewhat over one and a half times as much as the untrained group; which implies that they are capable of so many more separate definite acts of attention. J. E. ANDERSON (Yale).

394. Banister, H., A Further Note on the Phase Effect in the Localization of Sound. *Brit. J. of Psychol.*, 1924, **15**, 80–81.

The phase effect cannot be explained as an intensity effect due to bone conduction. J. E. Anderson (Yale).

395. Farnsworth, P. R., Notes on the Pitch of a Combination of Tones. *Brit. J. of Psychol.*, 1924, **15**, 82–85.

Ten subjects, whose musical training was known, were given the two Valentine tests, and Stumpf's test for the pitch of combination tones, the results of which have seemed contradictory. An individual without musical training is apparently influenced by the pitch of the lower constituent. This much agrees with Stumpf. As musical training is undertaken, the individual is taught to look to the upper series of tones for the melody. At length, the upper constituent becomes more influential than the lower. This is what apparently happened in Valentine's subjects. J. E. Anderson (Yale).

396. Shawe, R. C., Variation in the Sensibility to Pressure Pain Caused by Nerve Stimulation in Man. *J. of Physiol.*, 1924, **58**, 288–293.

Weak faradic stimulation causes a lowering and strong faradic stimulation a raising of the pressure pain threshold immediately afterwards. L. T. Spencer (Yale).

397. Sherrington, C. S., Notes on Temperature After Spinal Transection, with Some Observations on Shivering. *J. of Physiol.*, 1924, **58**, 405–424.

Spinal transection results in absence of temperature adjustment posterior to transection. Sweating and shivering cannot be induced. Posterior body temperature varies conspicuously with the environmental temperature. L. T. Spencer (Yale).

398. Roaf, H. E., A Simple Device Whereby Some Color Blind (Hypochromatic Vision) Persons Can Recognize Color Differences. *J. of Physiol.*, 1924, **59**, Proc. of Royal Soc. xxix.

Use of a red screen enables a color blind individual to discriminate colors, *e.g.*, yellow and green, otherwise considered a match. L. T. Spencer (Yale).

399. Ferree, C. E., and Rand, G., Further Studies on the Extent and Shape of the Color Fields in Relation to the Intensity of the Stimulus Light. *Amer. J. Physiol. Optics,* 1924, **5**, 409–419.

Text and charts showing the effects, on the color fields for red, green and blue, of stimulus intensities ranging from 51 to 0.03 foot-candles. The results show great differences in the extent of the field and the authors point out that, unless this factor be taken into account, little dependence can be placed on the size or shape of the fields. S. W. Fernberger (Pennsylvania).

400. Sheard, C., On the Effects of Quantity and Quality of Illumination Upon the Human Eye and Vision. *Amer. J. Physiol. Optics,* 1924, **5**, 468–485.

Discussion of results which leads the author to make a number of conclusions regarding the requirements for good lighting of rooms. S. W. Fernberger (Pennsylvania).

401. Piéron, H., Le Mécanisme d'Apparition Des Couleurs Subjective de Fechner-Benham. *L'Année Psychol.,* 1922, **23**, 1–49.

An explanation of the subjective colors seen in Benham's top is the purpose of the present article. This "top" consists of a disc half white and half black, having on its white surface four sets of narrow black concentric arcs (three in each set) of 45° each. When rotated at a speed which allows a slight amount of flicker the effect is that of four sets of concentric rings, each set of a different color. The order of these colors follows the spectral order or the reverse, according to the direction of rotation. In Piéron's experiment variations of Benham's top were used, so that the relative size and position of the black and the white sectors, as well as the size, position, and thickness of the arcs were controlled. The speed of rotation and the color of the illumination were also varied. Slight inequalities in the length of time necessary for each color process excited by a white light to reach its maximal intensity in the retina appear to explain the variation in color; and the spectral order of Benham's top is due to the fact that red reaches its maximum most quickly and blue least, and that they disappear in the same order. The fact that the subjective colors appear on both sides of the rings, though not in the middle, is explained by supposing that since the retina is intensely stimulated by the white which borders each ring there is

a diffusion into the relatively unstimulated region of the ring—a diffusion not of the white process, but of the colored one which is due to the above mentioned lag of each color process in reaching its maximal intensity. These explanations are formulated into two laws which may be applied to other cases besides that of Benham's top. M. B. PRATT (Harvard).

402. WOOSTER, M., Certain Factors in the Development of a New Spatial Coördination. *Psychol. Mono.*, 1923, 32, 4 (whole No. 146), pp. 96.

The problem of space perception is here attacked by a technique suggested by Stratton's famous experiment with reversing prismatic glasses. Miss Wooster employed prismatic glasses producing distortion of the visual field by which objects directly in front of the subjects were seen as at about 21 degrees to the right. Seventy-two subjects were used. The accuracy of localization, by reaching movements, of objects (electric buzzers) arranged in definite positions was measured. It was found that readjustment to the changed visual situation required definite reaching movements of the hand, *i.e.*, a passive subject does not gain effective perception of the visual situation. Subjects who had no apparent sensory stimuli to indicate the actual position of the object (they pointed to it but only the experimenter could see the subject's hand) nevertheless showed progressive readjustment, this being interpreted as unconscious adaptation of the reaching movements to the new kinesthetic stimuli from the eye muscles. Sounding the buzzers increased the amount of readjustment but little. Contact with the buzzer, when exploratory movements were permitted, brought rapid and complete readjustment; but visual perception of the amount of error proved still more potent in the development of new habits of localization. Striking individual differences appeared in ability to acquire the new coördination, and also in the sensory factors found most favorable. The learning seemed to be on a purely sensory motor basis, ideational factors playing no part. This is an excellent contribution to the literature of space perception. L. A. PECHSTEIN (University of Cincinnati).

403. HALVERSON, H. M., Tonal Volume as a Function of Intensity. *Amer. J. of Psychol.*, 1924, 35, 360–367.

Differential limens were obtained for the volume of tones of constant pitch (obtained from an audio-oscillator tube) which varied in their physical intensity. It was found that the volume varied in

the same direction as the intensity, the weaker tones sounding smaller, and that the volumic changes were of the same nature as the volumic changes which accompany variations in pitch. The procedure was by constant stimuli and the liminal values were obtained by linear interpolation. Intensive limens were similarly determined for purposes of comparison. The volumic limen was much larger than the intensive limen, so that the two aspects are independently variable and must represent separate attributes. Weber's Law appears to hold for volume as a function of intensity as well as for volume as a function of frequency. G. J. Rich (Chicago, Ill.).

404. Garrison, W. A., The Effect of Varied Instructions on the Perception of Distances in Terms of Arm Movement. *Amer. J. of Psychol.*, 1924, **35**, 420–435.

Thresholds for extent of arm movement were determined by the method of constant stimuli under two sets of instructions. Instruction A required the observer to judge objectively the distance through which his arm moved; instruction B called for judgments in terms of the pressure pattern these movements set up in the elbow. It was found that a change of instruction did not necessarily bring about a corresponding change of attitude in the observer. The limens were relatively larger under the object instruction (A) than under the pattern instruction (B) in the early series, but after practice the difference tended to disappear. There was little difference in the coefficient of precision under the two conditions. No effect of practice was evident after the first 4,300 of the 8,700 judgments made by every observer. G. J. Rich (Chicago, Ill.).

405. Findley, A. E., Further Studies of Henning's System of Olfactory Qualities. *Amer. J. of Psychol.*, 1924, **35**, 436–445.

Thirteen odorous substances were compared with six others typical of the six corners of Henning's prism. The procedure was by the method of paired comparisons, ten observers being used. It was then attempted to fit the results into Henning's classification. The results showed an internal consistency of the placement of the odors within the prism which indicated that the prismatic form is approximately but not precisely valid. Within the limits set by the variability agreement was found with the work of other investigators. Absolute judgments of affective tone showed that fragrant ethereal, spicy and resinous odors were usually pleasant, and that putrid and burned odors were usually unpleasant. G. J. Rich (Chicago, Ill.).

406. Rich, G. J., Facts and Theory in Auditory Analysis. *Amer. J. of Psychol.*, 1924, **35**, 467–468. G. J. Rich (Chicago, Ill.).

407. Henderson, Y., Musical Echoes. *Science*, 1924, **60**, 282–283. G. J. Rich (Chicago, Ill.).

4. FEELING AND EMOTION

408. Garth, T. R., A Color Preference Scale for One Thousand White Children. *J. of Exper. Psychol.*, 1924, **7**, 233–241.

On the basis of tests in color preference performed on one thousand white subjects the writer presents the following order of color preferences: Blue, green, red, violet, orange, yellow, white. The measures of overlapping indicate that the differences are significant except in the cases of red and green, and violet and orange. In terms of "pull" as derived from a scale which calls the "pulling power" of Yellow unity, the following values are yielded: Yellow, 1; orange and violet, 1.5; red and green, 1.8; blue, 3. On such a scale the values for all the colors are higher for males with the exception of yellow and blue. By fractionating the data according to educational groups it turns out that blue is the only color which increases in value over extended periods of time. All other colors, and especially red, tend to fall off in value in proportion as education progresses. C. C. Pratt (Harvard).

5. MOTOR PHENOMENA AND ACTION

409. Lipmann, O., Arbeitszeit und Erzeugungsmenge. *Internat. Rundschau der Arbeit*, 1924, **2**, 501–525.

So umfangreich die Literatur über den Zusammenhang zwischen Arbeitszeit und Arbeitsleistung ist, so wenig kann sie den Wissenschaftler befriedigen oder dem Wirtschaftspraktiker zuverlässige Richtlinien geben. Otto Lipmann deckt das Problem in seiner ganzen Kompliziertheit auf und kommt zu dem Schluss, dass nicht das Höchstmass, sondern das Bestmass wirtschaftlich den Ausschlag gibt, das nach Industrien, Betrieben und Rassenverschieden ist. Unberührt davon bleibt der kulturelle Gesichtspunkt, der u. U. die gesetzliche Festlegung einer verallgemeinermden Begrenzung der Arbeitszeit rechtfertigen kann. Eine Fülle von Beispielen aus verschiedenen Ländern veranschaulichen die sehr beachtenswerten, z. T. ganz neuen Gedankengänge. H. Sachs.

410. Riesser, O., und Simomson, E., Physiologische und pharmakologische Untersuchungen über die Beziehungen des Mittelhirns zum Muskeltonus beim Frosch. *Arch. f. d. ges. Physiol.*, 1924, **203**, 221–246.

Injiciert man bei einem Frosch Cocain oder Tetrahydro-β-Naphthylamin u. s. w., so tritt an der Zuckungscurve des Muskels (Gastroknemius) nach direkter oder indirekter Reisung eine Nachkontraktur auf. Diese Nachkontraktur ist reflektorischer Natur, sie verschwindet, sobald der Reflexbogen an irgend einer Helle unterbrochen wird. Das Zentrum dieses tonischen Reflexes ist das Mittelhirn, die zentripetale Bahn sind die hinteren Wurzeln, die zentrifugale Bahn die vorderen Wurzeln. Exstirpation des Sympathicus hat keinen Einfluss, Atropin und Adrenalin hebt die Nachkontraktur auf. Stich in das Mittelhirn (Tonusstich) ergibt dieselbe Wirkung wie Cocainvergiftung. Der beschriebene tonische Reflex ist von den von *E. Frank* und von *de Boer* beschriebenen tonischen Erschienungen zu trennen, aber verwandt mit den Phaenomenen der Sherrington'schen Enthirnungsstarre. W. Steinhausen (Frankfurt a/M.).

411. Warden, C. J., Primacy and Recency as Factors in Cul-de-Sac Elimination in a Stylus Maze. *J. of Exper. Psychol.*, 1924, **7**, 98–116.

For this experiment a form of maze was used which was sufficiently difficult for the human subject and involved only a single type of cul-de-sac. Two patterns of the maze were constructed, the only difference in the two being that one was a lateral reversal of the other. Sixty subjects took part in the experiment. The results support the view, generally held for rote learning, that primacy and recency are important factors in determining the formation of motor responses. The fact that the end positions were mastered first and the middle last weakens the view that the regressive order of elimination is characteristic of maze learning. There was a marked tendency for the right hand to enter more frequently and persistently the culs-de-sac located on the left half of the maze, and for the left hand to enter those on the right half. Culs-de-sac situated far outward to the right or left of the median line were uniformly eliminated early in the series. For some obscure reason the first pattern of the maze proved to be the more difficult of the two. That such a small difference in the maze should alter the results to such an extent suggests the unreliability of making direct comparisons of data

obtained from mazes that differ greatly in pattern. C. C. Pratt (Harvard).

412. Travis, R. C., A Study in the Measurement of Muscle Tonus and its Relation to Fatigue. *J. of Exper. Psychol.*, 1924, 7, 201–212.

Experiments with an apparatus designed to measure muscle tonus show that there is a large difference between the relaxed muscular state or the state of normal tonus and the state of muscular contraction. The average increase in tonus in the latter state is 85 per cent. Physical exercise decreases muscular tonus. The experiments bear witness to the rather unexpected fact that muscular tonus is greater at the time of retiring than at the time of arising. C. C. Pratt (Harvard).

413. Hyde, I. H., Effects of Music Upon Electrocardiograms and Blood Pressure. *J. of Exper. Psychol.*, 1924, 7, 213–224.

The writer reports the results of some tests of the effects of various styles of music on individuals fond of music, persons indifferent or not sensitive to music, Indian students, neurasthenics, and animals, as evidenced by records of pulse rate, pulse pressure, velocity of blood flow, and electrocardiograms. C. C. Pratt (Harvard).

414. Warden, C. J., The Relative Economy of Various Modes of Attack in the Mastery of a Stylus Maze. *J. of Exper. Psychol.*, 1924, 7, 243–275.

This investigation was undertaken for the purpose of finding out whether there is any typical mode of attack to the problem of the maze among human subjects, and whether one mode of attack is more economical than another. Sixty subjects took part in the experiment. After each subject had learned the maze he was asked to report whether he had relied chiefly on verbal imagery (*i.e.*, memorizing the direction and order of the turns by attaching verbal symbols to them), visual imagery, or kinesthetic imagery. It turned out that over 40 per cent of the subjects depended primarily upon either explicit or implicit verbalization, while less than 30 per cent reported the use of the motor mode of attack. Thirty per cent relied on visual schemas of some sort. Verbalization proved to be by far the most economical method, requiring on the average

less than one-fourth as many trials as the motor reaction, and approximately one-half as many trials as the visual method. The reports of those subjects who relied on kinesthesis gave evidence of disturbing factors which were not present in the verbal method. As part of the experiment the subjects were given the Alpha and Thorndike tests. In the case of 40 subjects there was found a significant positive correlation between the records in maze learning and the scores in the mental tests. The scores in the mental tests for the word reaction group were over 11 per cent higher than those for the motor reaction group. C. C. PRATT (Harvard).

415. REED, H. B., Fatigue and Work Curve from a Ten-Hour Day in Addition. *J. Educ. Psychol.*, 1924, **15**, 389–392.

Like so many who have worked on the problem of fatigue the author presents evidence the results of which depend entirely on the point of view assumed. Eight subjects added five two-figure problems from 7:30 in the morning to 5:30 in the afternoon with a thirty-five-minute interval for lunch after four and three-fourths hours continuous work in the morning. Time was called every minute for the first fifteen minutes of work and then every ten minutes thereafter until the last ten minutes of work was reached when time would again be called every minute. For the various interpretation of results the reader is referred to page 390 of the Journal. Of the various methods discussed the one which appeals to the author is the increase in the right minus wrong from the ten-minute period before rest to the ten-minute period after rest. The Kraepelin characteristics of the work curve, initial spurt, end spurt, adaptation, practice effect and fatigue are not present. Fatigue is only present to a slight degree. G. M. MICHAELS (Columbia).

416. HILL, A. V., LONG, C. N. H., and LIPTON, H., Effect of Fatigue on the Relation Between Work and Speed in Contraction of Human Arm Muscles. *J. of Physiol.*, 1924, **58**, 334–337. L. T. SPENCER (Yale).

417. BRISCOE, G., On the Variation in Excitability Produced by the Extension of Muscle. *J. of Physiol.*, 1924, **58**, Proc. of Physiol. Soc., xxx–xxxi.

The threshold for contraction of the diaphragm and gastrocnemius muscles is lowered when the muscles are stretched. L. T. SPENCER (Yale).

418. Gillespie, R. D., The Relative Influence of Mental and Muscular Work on the Pulse Rate and Blood Pressure. *J. of Physiol.*, 1924, **58**, 425–432.

Mental work (addition) causes an increase in pulse rate and blood pressure. This increase is greater when muscular and mental work are combined than with either singly. L. T. Spencer (Yale).

419. Cooper, S., and Adrian, E. D., The Maximum Frequency of Reflex Response in the Spinal Cat. *J. of Physiol.*, 1924, **59**, 61–82.

Improved technique results in raising the maximum frequency for the tibialis ancus muscle previously reported as 160 per second to a range between 240–320 per second. This range agrees with Beritoff's records for the semitendinosus muscle. The muscle will respond however at a greater rate if its motor nerve is stimulated directly. L. T. Spencer (Yale).

420. Liddell, E. G. T., and Sherrington, C. S., Reflexes in Response to Stretch (Myotatic Reflexes). *Proc. Royal Soc.*, 1924, **B96**, 212–242.

Stretching a muscle (*e.g.* the knee extensor) produces a contraction which is reflex and proprioceptive. The contraction ceases immediately after cessation of the stretch. The contraction can be inhibited or eliminated by the usual methods. The knee jerk and patellar clonus, it is suggested, are examples of such reflexes, as the mechanical stretch of the muscles provides the excitation for the reflex. Some applications of the results obtained to reflex coördination of standing and locomotion are considered. L. T. Spencer (Yale).

421. Cooper, S., and Adrian, E. D., Electric Responses in Reflex Contractions of Spinal and Decerebrate Preparations. *Proc. Royal Soc.*, 1924, **B96**, 243–258.

Electrical responses are shown to occur in primary and secondary wave formations. The relation of the electric response characteristics to the characteristics of mechanical responses studied by Liddell and Sherrington is indicated and discussed. Secondary waves are shown not to depend on proprioceptive impulses. Illustrative plates are given. L. T. Spencer (Yale).

422. Koch, H. L., The Influence of Mechanical Guidance Upon Maze Learning. *Psychol. Mono.*, 1923, **32**, No. 5 (whole No. 147), pp. 112.

Using a technique developed by earlier experimenters for securing highly comparable learning conditions for animal and human subjects, the author of this monograph studied the effect of placing barriers just within the entrance to each cul-de-sac of the maze employed. For the rats, these barriers were of glass; for the human subjects, who worked with a concealed stylus maze, small pegs which could be noiselessly changed. Variations in this control consisted of changes in its length of application and in its position in the series of trials. In general, human and animal results under the supposedly similar conditions diverged widely. This is conceivably due to the human learning occurring partly above a sensorimotor level. For example, the human learner may contrast the true path with the blind alleys through the aid of properly interpolated guidance. The author gives this as a possible reason why the efficacy of the control varies, in general, for the human subjects directly as the distance of the period of control from the initial trial. The correlation between retention and guidance was found to be nearly negligible, as a rule. The popular belief that what one learns without aid, he retains best, was not supported. It should be noted that control of the sort employed was not in every respect or invariably beneficial to the learning process. In many cases, it seemed to give the learner, whether animal or human, a set of cues the subsequent absence of which proved very confusing. L. A. Pechstein (University of Cincinnati).

423. Stetson, R. H., and Tuthill, T. E., Measurements of Rhythmic Unit-Groups at Different Tempos. *Psychol. Mono.*, 1923, **32**, No. 3, 41–51.

Professional musicians prove unable to tap a musical iamb with the tempo of the theoretical ratio, as measured on a kymograph record. The theoretical ratio is not even attained as an average. It is inferred that the sense of rhythm cannot be explained in terms of judgment of time intervals. The conception of a rhythmic unit-group as an organized group of movements whose conditions are muscular is suggested as nearer to fitting the facts. L. A. Pechstein (University of Cincinnati).

424. Stetson, R. H., and McDill, J. A., Mechanism of the Different Types of Movement. *Psychol. Mono.*, 1923, **32**, No. 3, 18–40.

Movements are classified as (1) movement of holding still fixation; (2) slow movement; (3) fast movement, (a) with tension, (b) ballistic. These classes differ, due to the number of movement elements in each type. The movement elements are considered equivalent to the tremor undulations. In training, the type of the movement changes from slow to ballistic, this involving decrease in the number of movement elements in the series, and a change from "controlled" to "free" movement. Plateaux in the learning curve are thus found to be due, not to periods of assimilation in which recent gains are being consolidated, compensation between improvement and fatigue, etc., but simply to lack of change in type of movement. Devices in training are important which lead to the development of new "forms" of the movement, *i.e.*, to the reduction of the number of movement elements. L. A. Pechstein (University of Cincinnati).

425. Ludgate, K. E., The Effect of Manual Guidance Upon Maze Learning. *Psychol. Mono.*, 1923, **33**, No. 1 (whole No. 148), pp. 65.

Two stylus mazes, one previously employed by Carr and a harder one used by Pechstein, were used in the experiments here reported. The experimental factor studied was the guidance by the experimenter of the stylus in the subject's hand for a given number of trials over the true pathway of the maze, thus avoiding all error possibilities. Such guidance proved beneficial, almost without exception. The optimum amount of guidance was a function both of the maze and of the criteria used. Guidance was of more value in the more difficult maze. Positive transfer from the learning of one maze to that of another was facilitated by guidance, the degree of transfer appearing to be a function of the way in which the first maze was mastered. The author believes the relative effectiveness of guidance to be a function of the particular act of skill learned. In some problems its efficacy may be decidedly limited. The author's final words stress "the possibility of an act of skill being perfected when the solution is given, and the process of fixation occurs without error rejection," and "the conclusion that error prevention in any portion of the early stage of the learning is more valuable than the making of errors

and their subsequent elimination." This is the third of a series of important studies from the Chicago laboratory on the effect of various forms of guidance in maze learning. Carr has reported the effect of visual guidance, Koch that of mechanical guidance, and Ludgate that of manual guidance. L. A. PECHSTEIN (University of Cincinnati).

6. ATTENTION, MEMORY AND THOUGHT

426. GIESE, F., Das ausserpersönliche Unbewusste. Theoretische Bemerkungen Zum Intuitiven Denken. *Sammlung Vieweg.*, 1924, **72**, 105.

"Das intuitive Denken ist nicht unmittelbares Ergebnis eines Gehirnvorgangs und kein schöpferischer Akt des Menschen, sondern besteht in seinem wesentlichen Inhalt in der Aufnahme von Aussenreizen, deren Ort ausserhalb des Ichs ruht, deren näherer Charakter noch unbekannt, im grossen und ganzen aber verwandt sein dürfte mit energetischen Vorgängen der Aussenwelt, welche unsere Sinneswahrnehmungen hervorrufen." Giese nimmt ferner an, dass diese energetischen Vorgänge "im wesentlichen elektrischer Natur" seien, und dass sie durch das vegetative Nervensystem aufgenommen werden. O. LIPMANN (Berlin).

427. WITTMANN, J., Über das Gedächtnis und den Aufbau der Funktionen. Eine Experimentelle Untersuchung Über Das An- und Abklingen Taktiler, Akustischer und Optischer Eindrücke. *Arch. f. d. ges. Psychol.*, 1923, **45**, 203–265.

Im Anschluss an Jaenschs Untersuchung subjektiver optischer Anschauungsbilder wird für andere Sinnesgebiete das Vorhandensein solcher Anschauungsbilder nachgewiesen. Die Eindrücke werden intermittierend in geordneten Folgen reproduziert: Anzahl, Tempo, Dauer der Reproduktion hängen von der Reizstelle, Intensität, Anzahl der Reize ab. Jüngere Erregungen beleben ältere. Die Erregungen ordnen sich dem Alter entsprechend additiv zu Reproduktionsfolgen (Aufbau der Funktionen); parallel geht ein Abbau. Die Stiftung solcher Funktionen hängt von der Aufmerksamkeit (organisierendes Prinzip) ab. Ablenkung der Aufmerksamkeit bedingt Nichtbelebung älterer Erregungen, Störung, Unterbrechung, Verkürzung und Verzögerung der Reproduktionsprozesse. Die Befunde werden im Sinne einer physiologischen Theorie des Gedächtnisses und eines funktionalen Verhältnisses von Leib und Seele gedeutet. WITTMANN (Kiel).

428. Robinson, E. S., and Heron, W. T., The Warming-up Effect. *J. of Exper. Psychol.*, 1924, 7, 81–97.

By introducing certain variations in tapping experiments and backward recitations of the alphabet, the writers succeeded in demonstrating the existence of the warming-up effect quite apart from what Thorndike calls "the more permanent improvement that comes from exercise of the function in general." This effect is most apparent under those conditions in which the task is interrupted, and tends to disappear, or at any rate to be obscured by other factors, in proportion as the interruptions are omitted. Warming-up may be considered, then, as a function of continuity of work. C. C. Pratt (Harvard).

429. Griffiths, C. H., and Gordon, E. I., The Relation Between the Traube-Hering and Attention Rhythms. *J. of Exper. Psychol.*, 1924, 7, 117–134.

In an effort to study the relation between Traube-Hering and attention rhythms the writers took plethysmographic and pneumographic records of ten subjects during their reactions to "attention" changes in such stimuli as visual images, minimal lights, binocular rivalry, and ambiguous perspective figures. A series of control experiments was included to discover whether the slight correspondence between circulatory and attention rhythms in the main series might not be due to the vasomotor accompaniment to the motor reaction. In this series the minimal light was made to disappear and reappear by altering the amount of resistance. An examination of the data shows that in general there are more appearances than disappearances during the first half of the Traube-Hering wave, and relatively more disappearances in the second half. But the same is true of the control series in which the minimal light was turned off and on and the subject reacted as to the fluctuations of the minimal stimulus. It would seem more correct therefore to suppose that attention rhythms are due rather to vasomotor accompaniments of the changes in attention and of the motor responses to those changes than to the influence of the Traube-Hering rhythms. C. C. Pratt (Harvard).

430. Reed, H. B., The Effect of Training on Individual Differences. *J. of Exper. Psychol.*, 1924, 7, 186–200.

The effect of equal practice or education on individual differences is usually measured either by noting the amount of work per unit

of time or the amount of time per unit of work. Both methods are equally valid for measuring efficiency, but at the same time each method leads to a different result. The former tends to increase, whereas the latter tends to reduce the initial individual differences. It follows then that both measures are invalid as an index of effect of equal training. The proper measure of the effect of training on individual differences is the ratio of the high scores to the low scores at the beginning and at the end of practice. The application of this method of measuring to the results of experiments devised to study the effect of practice on different initial abilities shows that practice decreases the individual differences, a result contrary to the view held by certain leading psychologists, *viz,* that equal training increases individual differences. C. C. Pratt (Harvard).

431. Foucault, M., Les Inhibitions Externes Concomitantes au cours de la fixation des images. *L'Année Psychol.,* 1922, **23**, 50–75.

The author regards what have usually been called attentive distractions as "external concomitant inhibitions." He takes up the 1895 paper of H. G. Smith ("The Relation of Attention to Memory") from this new point of view. Smith claimed that slight distractions may be an aid to attention. From his own experiments, described in the present article, Foucault reasons that Smith's interpretation was not warranted by the facts. Foucault makes use of introspective data and by combining these with his numerical results concludes that in general: (1) slight distractions have at first an inhibiting effect on learning; (2) after a certain period of time which differs with the individual, adaptation sets in and the distracting stimulus is disregarded; (3) but in proportion as the distracting stimulus becomes less distracting the absence of this stimulus is itself likely to take on the character of a distraction. Because of the setting up of this secondary inhibition stronger than the primary, the latter appears in the light of a facilitation. M. B. Pratt (Harvard).

432. Piéron, Mme. H., Contribution Expérimentale à l'étude des Phénomènes de Transfert Sensoriel. *L'Année Psychol.,* 1922, **23**, 76–124.

The object of this experiment was to study the manner in which an impression received by one sense is translated into an equivalent impression in another sense. For this purpose visual stimulation,

both instantaneous and of longer duration, was used, as well as active and passive kinesthesis of the two hands. These different manners of presentation were combined in various ways with kinesthetic reproduction and recognition and with visual recognition. The perception involved was that of a certain length of line. Among other things Mme. Piéron found that transfer from one sense to the other gave the least accurate results, and that the combination of vision with exploratory movements of the eye is in general a very favorable one, as is also transfer from one hand to the other. The different transfers involved in recognition were more accurate than those concerned in the translation of a perception into a reproductory movement which is based on more usual and natural associations, but their precision showed nevertheless that, even over and above the common elements which may intervene, there exist rather constant associations between the different sense departments in the perception of extents. M. B. Pratt (Harvard).

433. Dwelshauvers, G., Recherches sur la mémoire des formes. *L'Année Psychol.*, 1922, **23**, 125–143.

This article deals with the reproduction of certain combinations of lines, some meaningless, some geometrical, presented visually. The author concludes that in the sort of memory necessary for such a task, unconscious rather than conscious processes are the more important, and that some new method ought to be devised which should systematically study these unconscious processes and their rôle in memory. M. B. Pratt (Harvard).

434. Liljencrants, J., Memory Defects in the Organic Psychoses. *Psychol. Mono.*, 1922, **32**, No. 1 (whole No. 143) 77.

Four patients in St. Elizabeth's Hospital in Washington, showing memory defects associated with organic psychoses (psychosis associated with cerebrospinal syphilis, senile or presenile psychosis, psychosis associated with cerebral arteriosclerosis, and toxic psychosis, Korsakow type), were given a series of memory tests with visual material consisting of pictures of objects and irregular figures. For comparison, certain of the tests were given to ten subjects not suffering from memory defects or organic psychosis. Anterograde amnesia, or inability to store up memories, was the only variety considered. The amnesia in the psychotic subjects was found to be due both to faulty apprehension and to faulty retention, and to

involve both recall and recognition. These various factors in the memory process were affected to varying degrees in the four subjects. Similar effects of long and short exposure of material to be remembered, and of primacy, recency, and repetition were found for the psychotic and normal subjects. L. A. PECHSTEIN (University of Cincinnati).

435. OBERLY, H. S., The Range for Visual Attention, Cognition and Apprehension. *Amer. J. of Psychol.*, 1924, **35**, 332–352.

The classical experiment upon "Range of Visual Attention" was repeated with psychophysical procedure. The stimuli consisted of dots which were exposed tachistoscopically. On the basis of preliminary introspective reports three types were distinguished and in the main experiment reports were made in terms of them. The first type was an immediate report in which all sensory elements had an equal and high degree of clearness. Limens of correct response for this type of report were called limens of range of attention. The second type of conscious pattern involved groupings of elements which occurred on different levels of clearness. The thresholds for cognition included the correct responses made upon either the immediate or the grouped basis. The most complex method of response involved counting with the use of some mediate process. Limens for visual apprehension included all forms of response. For all categories, the degree of assurance was reported and judgments lacking in certainty were eliminated as doubtful. The numerical values of the thresholds were greatest for apprehension, intermediate for cognition and least for attention. The coefficients of precision were largest for attention and smallest for cognition, with apprehension intermediate. Progressive practice tended to increase the value of the threshold, especially for attention. G. J. RICH (Chicago, Ill.).

436. WELCH, G. B., and BURNETT, C. T., Is Primacy a Factor in Association-Formation? *Amer. J. of Psychol.*, 1924, **35**, 396–401.

In two experiments in learning nonsense syllables in which the observers were not controlled with respect to their manner of learning, it appeared that the first syllable of the series had a distinct advantage over other syllables, the factor of Primacy. In a later experiment, unpronouncable syllables were learned and the observer instructed not to attend to or repeat in memory any syllable after

it had been once exposed. Under these conditions, the first syllable was remembered less than most of the others and the factor of Recency predominated. G. J. Rich (Chicago, Ill.).

437. Don, V. J., and Weld, H. P., Lapse of Meaning with Visual Fixation. Amer. J. of Psychol., 1924, **35**, 446–450.

In this experiment words were fixated visually until the observer indicated that the meaning of the particular word had lapsed. The time from the presentation until the lapse varied between observers according to the attitude that each took. The most rapid times were comparable with those previously found for lapse of meaning with verbal repetition. The majority of meanings were visual. The lapse took place instantaneously. When the normal meaning had lapsed the experience was either a feeling of blankness in which the stimulus word was devoid of all meaning, or a perception of certain elements of the stimulus word which had become insistent. G. J. Rich (Chicago, Ill.).

438. Wilson, M. V., and Weld, H. P., Delayed Meaning. *Amer. J. of Psychol.*, 1924, **35**, 450–453.

A situation in which meaning was not immediate was produced by the experimenter pronouncing familiar words in a dialect unfamiliar to the observers. Under these conditions delayed meaning occurred in nearly half of the experiments. The appearance of meaning after delay was marked by its suddenness. Cases of the "dawning of meaning" in the sense of experienced growth from an earlier stage seemed to be illusory. The experience during the interval of delay was characterized by a definite awareness of "no meaning," by processes concerned with the search for meaning, and when the interval is long by effort and states of uncertainty, doubt, hope or despair. G. J. Rich (Chicago, Ill.).

439. Spencer, L. T., A Note Regarding Retroactive Inhibition After a Twenty-Minute Intérval. *Amer. J. of Psychol.*, 1924, **35**, 466–467.

Retroactive inhibition in learning nonsense syllables with the inhibiting series occurring nine seconds after learning and twenty minutes after learning were compared. In both cases the test followed the inhibiting series by a nine-second interval. Under these conditions less inhibition was found, on the average for the twenty-minute interval than for the nine-second interval. G. J. Rich (Chicago, Ill.).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

440. Moede, W., Die Eignungsprüfung im Dienste der Betriebsrationalisierung. *Industrielle Psychotechnik,* 1924, 1, 1–16.

Gibt eine Uebersicht über den gegenwärtigen Stand der Eignungsprüfung und ihrer wirtschaftlichen und sozialen Bedeutung im Kräftehaushalt des Privatbetriebes. Ihre volle Auswirkung für die Rentabilität eines Unternehmens findet die Eignungsprüfung dann, wenn sie mit Anlernung und Arbeitsrationalisierung psychotechnischer Art innig verschmolzen wird. Die Rentabilität solcher Massnahmen ist keinswegs geringer wie der Nutzen der Sparmassnahmen wärmetechnischer und sonstiger betriebstechnischer Natur, sofern die geeigneten Vorbedingungen gegeben sind. H. Bogen (Berlin).

441. Schwarze, B., Beiträge zur Frage der Personalauswahl in Grossbetrieben mit Besonderer Berücksichtigung der Deutschen Reichsbahn. *Industrielle Psychotechnik,* 1924, 1, 17–21.

Untersucht die bisher geühten Verfahren zur Feststellung der Tauglichkeit von Bewerbern für einen bestimmten Dienstzweig innerhalb eines Grossbetriebes. Es kommen dafür in Frage: die Selbstaussage des Bewerbers, Auskünfte durch dritte, polizeiliche Auskunft, staatsanwaltliche Bescheinigung und Prüfung der Gesundheitsverhältnisse. Allen diesen Verfahren haften für eine Eignungsfeststellung grobe Mängel an, sodass eine feinere Auslese der Bewerber nach andern Kriterien einsetzen musste. Das graphologische Gutachten weist zu starke nicht fassbare Eigenheiten auf, sodass S. zur Ablehnung desselben kommt. In der Fortentwicklung der psychotechnischen Eignungsprüfungen wird die vorläufig beste Möglichkeit einer fruchtbaren Personalauswahl gesehen. Bei der Reichseisenbahn erstrecken sich die Prüfungen bis jetzt auf Werkstattlehrlinge, Fahrkartenausgeber, Rangierer, Bahnsteigschaffener. Ferner sind Prüfungen für Bureaubeamte vorgenommen worden. Sie sollen vor allen Dingen den Zwecken der Beamtenüberweisungen in andere Abteilungen dienstbar gemacht werden, indem man nur die Geeigneten, d. h. solche, die sich voraussichtlich sehr schnell in eine neue Materie einarbeiten werden, überweist. Ferner fallen den Eisenbahnprüfstellen noch die Aufgaben zu, begabte Leute für schnelleren Aufstieg auszuwählen. H. Bogen (Berlin).

442. Couvé, R., Die Psychotechnische Prüfung von Eisenbahnverkehrsbeamten. *Industrielle Psychotechnik,* 1924, 1, 22–29.

Die Prüfung erstreckt sich auf Fahrkartenausgeber und Beamte im inneren Gepäck- und Güterabfertigungsdienst. Geprüft werden: Gebundene Kombination, Merkfähigkeit für Ortsnamen und Zahlen, Konzentration, Beobachtung, Sorgfalt, Rechnen unter Zeitzwang, Ablenkbarkeit bei Mehrfachhandlung, Arbeitsgeschwindigkeit und Gewissenhaftigkeit, Geschicklichkeit und Erregbarkeit bei drängender Arbeit, Konzentration auf schnelles Erfassen bewegter Reize und Reaktionsschnelligkeit. Verschiedene vergleichende Bewährungskontrollen erweisen die Brauchbarkeit des Verfahrens, So liegt z. B. in einer Arbeitsprobe an einem schematischen Fahrkartenschrank die Leistung von 50 besonders guten Fahrkartenausgebern um 43 per centum über dem Durchschnitt von 119 vorher geprüften Beamten von verschieden guter Befähigung. H. Bogen (Berlin).

443. Kurrein, M., Leistungskontrolle als wirkliche Betriebskontrolle. *Industrielle Psychotechnik,* 1924, 1, 29–36.

Ueberblick über die Entwicklung der Registrierapparate zur Kontrolle der Arbeitsleistungen. H. Bogen (Berlin).

444. Tramm, K. A., Die Bewährung des psychotechnischen Prüfverfahrens für Strassenbahnführer. *Industrielle Psychotechnik,* 1924, 1, 36–42.

Die Prüfung erstreckt sich auf Gedächtnis für sinnvolle Stoffe, Ergänzung von Lücken in einem Text, Beurteilung technischer Zeichnungen, Kombinieren von Teilen, Sehschärfe, Schnellsehen, Farbensehen, Hörschärfe, Schall-lokalisation, Armkraft, Körperkraft, Bückleistung, Handruhe, Geschicklichkeit, Schnelligkeit, Anlernfähigkeit, Umsicht und Schreckverhalten. 25–30 per centum aller gemeldeten Anwärter erweisen sich als ungeeignet zum Fahrer. Die Unfälle und Zusammenstösse einer geprüften und einer ungeprüften Fahrergruppe werden verglichen. Im ersten Jahre verursachten die nicht geprüften Fahrer 50 per centum mehr schuldige Unfälle als die geprüften Fahrer. Auch im zweiten Jahr beträgt der Unterschied noch 40 per centum. Für jede Prüfleistung wurde ihr Zuverlässigkeits-grad bestimmt, ebenso der des Gesamtverfahrens. Dieser beträgt 85–90 per centum Das Prüfungsverfahren zog eine Verkürzung der Ausbildungsdauer bei Kraftfahrern um 48 Stunden, bei Strassenbahnfahrern um 120 Stunden nach sich. Verf. berechnet, dass bei einer allgemeinen Durchführung der Prüfungen an Kraft-

fahrern und Strassenbahnführern die Zahl der tödlichen Unfälle um 20 per centum reduziert werden könnte. H. Bogen (Berlin).

445. Eucken, R., Ethik als Grundlage des Staatsbürgerlichen Lebens. *Päd. Mag.*, 1924, **985**, 55.

Als 15.Heff der "Schriften aus dem Euckenkreise" bietet der greise Philosoph des ethischen Idealismus besonders prinzipielle Erwägungen über Staat und Nation und den Kampf der Ideen im modernen Staatsleben: Ganzes und Individuum im Staatsleben, Beharren und Bewegung im politischen Leben, Das Verhältnis von Geistigem und Sinnlichem im Zusammenleben. Das Schlusskapitel wendet sich in ernstem, offenem Freimut den deutschen Gefahren, den deutschen Aufgaben und der Möglichkeit seines Aufstiegs zu. F. W. Schroeder.

446. Poffenberger, A. T., Psychological Tests in Advertising. *J. of Exper. Psychol.*, 1924, **7**, 312–320.

In a recent study of advertising by means of the association test (*J. of Experimental Psychol.*, 1923, **6**, 357–365) Laird finds that there is a discrepancy between brand name recalled and brand used, or between association and use. On the basis on these findings he condemns the association test as worthless in studying the psychology of advertising. Professor Poffenberger points out that by such reasoning the Schick test for diphtheria susceptibility might be condemned because it is an unsatisfactory test for syphilis. The association test is admirably suited to the investigation of the laws of memory and recall, but it has never been maintained that the test will measure extent of use of a given commodity. The discrepancies which Laird found between association and use are significant and should be studied with an eye to their causes. This discovery only serves to strengthen the conviction that in the association test as applied to the study of advertising there is still a wealth of possibilities still untouched by experimenters. C. C. Pratt (Harvard).

447. Gunther, E., An Ancient Record of Righthandedness. *Amer. J. of Psychol.*, 1924, **35**, 465. G. J. Rich (Chicago, Ill.).

448. Berliner, A., Geometrisch Ästhetische Untersuchungen mit Japanern und an Japanischem Material. *Arch. f. d. ges. Psychol.*, 1924, **49**, 3–4.

Bei Zweiteilung von vertikalen Strecken wurden Verhältnisse in der Nähe des goldenen Schnittes, von horizontalen Strecken Sym-

metrie und goldener Schnitt bevorzugt. Bei Rechtecken niedriger als Quadrat lagern sich die bevorzugten Werte um ein Verhältnis in der Nähe des goldenen Schnittes. Dasselbe Resultat ergab sich bei Bildern entsprechender Form. Bei Rechtecken höher als Quadrat und niedriger als doppelte Basis scharen sich die Werte um ein Verhältnis niedriger als der goldene Schnitt. Bei Bildren entsprechender Form sinkt das Verhältnis noch tiefer. Für Bilder ergibt sich ausserdem ein Maximum bei einer Höhe zwischen zweifacher und dreifacher Basis, entsprechend einer Form des Kakemono. A. BERLINER (Halberstadt).

8. SPECIAL MENTAL CONDITIONS

449. LISZT, E. v., Zur Physiologie des Traumes. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 86–87.

Der Verf. fügt zwei Beobachtungen dafür an, dass man 1. im Traume mit dem Bewusstsein des Traumes einen Entschluss fassen und sofort wirklich ausführen kann, 2. dass man einen im Wachzustand für den Fall eines bestimmten Traumes gefassten Beschluss im Traume mit dem vollen Bewusstsein von dem Vorliegen eines Traumes ausführen kann. O. LIPMANN (Berlin).

450. PAULI, R., Die psychische Wirkung des Teees. *Z. f. angew. Chemie*, 1924, **37**, 363–364.

Die versuche, an den 4 bis 8 Vpp beteiligt waren, bestanden im fortlaufenden schriftlichen Addieren je zweier einstelliger Ziffern. Die Leistung wurde in Intervallen von je 3 Minuten festgestellt. Auf einen Uebungs-Versuch von 1 Stunde Dauer folgten die Hauptversuche gleichfalls von 1 Stunde Dauer, bei denen die Versuchspersonen 0, 2½, 5 oder 10 g. indischen, je 3 Minuten lang aufgebrühten Peccotee erheilten. Die Wirkung des Tees zeight sich in einer Steigerung der Anzahl der in je 3 Minuten addierten Ziffern, in einer Vermehrung sog. "Übermaximaler" Leistungen (>75) und in einer Verringerung der Leistungs-Spannweite (Differenz zwischen der grössten und der kleinsten 3 Minuten-Leistung innerhalb 1 Stunde). Die Höchstleistung tritt unter dem Einflusse von Tee durchschnittlich 5 bis 10 Minuten früher ein als ohne Tee. O. LIPMANN (Berlin).

451. Raspe, C., Untersuchungen über Kinderträume. *Z. f. päd. Psychol.*, 1924, 25, 156–178.

Aus einer Sammlung von Traumberichten, welche von 533 Kindern im Alter von 8-15 Jahren stammt, geht hervor, dass die Mädchen häufiger träumen als die Knaben. Die Traummotive sind relativ einförmig. Am häufigsten treten Verfolgungs- und Wunschträume, sowie Träume über Unglücksfälle auf. Etwa 72% aller berichteten Träume sind unlustbetont. Die Veranlassungen der Träume liegen teils in äusseren Reizen, in überwiegender Zahl jedoch in einem Fortdauern der Vorstellungs- und Denktätigkeiten. Unter den Traumgestalten nehmen Familienmitglieder eine bevorzugte Stellung ein, besonders bei den Mädchen. Auch Tierträume zeichnen sich durch stärkere Häufigkeit aus. Es ist wahrscheinlich, dass bei Kindern durchweg nur solche Träume reproduziert werden, die einen festen räumlichen Hintergrund aufweisen. Träume mit erotischem Anklang sind nur zwei unter 362 berichtet worden. Ein wesentlicher Unterschied der Struktur der Kinderträume von der Erwachsenen ist nicht nachweisbar. Die Ursachen des Traumes sehen die Kinder in Perseverationen, in physiologischen Vorgäungen, in äusseren Reizen akustischer oder taktiler Art und in religiösen Faktoren. H. Bogen (Berlin).

452. Kreidl, A., & Herz, F., Der Schlaf des Menschen bei Fernbleiben von Gesichts- und Gehöreindrücken. (Ueber den Schlaf des Mindersinnigen). *Archiv f. d. ges. Physiol.*, 1924, 203, 459–471.

Mit Hülfe des Aktographen, eines Bettes, das jede Bewegung des Daraufliegenden zeitlich registriert, wird Eintritt, Gleichförmigkeit und Dauer des Schlafs bei Mindersinnigen (Taube, Blinde und Taubblinde) untersucht. Der Schlaf trat bei diesen beim Still liegen und Fernhalten anderer Reize nicht schneller ein als bei normalen. Er ist in der Regel auch nicht ruhiger und nicht von längerer Dauer. Nur die Kurven des einen Taubblinden zeichneten sich durch auffallend lange ruhige Zeiten aus. Es wird geschlossen, dass 1) das Wachsein mehr durch innere als durch äussere Reize bestimmt wird, dass 2) das Vorhandensein äusserer Reize mehr das Wachbleiben unterstützt als ihre Fernhaltung schlafauslösend wirkt. A. Bethe (Frankfurt a/M.).

453. Ikin, A. G., and Pear, T. H., The Psycho-galvanic Phenomenon in Dream Analysis. *Brit. J. of Psychol.*, 1924, **15**, 23–43.

Emotional changes result in a sudden decrease of the subject's resistance, followed by a comparatively slow increase toward the original value. After a number of preliminary experiments to determine the effect of attention without emotional coloring, upon the psychogram, a study was made of the effect of relating unanalyzed dream material upon the psychogalvanic phenomenon. Decided changes were discovered at certain points in the dream material, which upon analysis were found to have considerable emotional content. J. E. Anderson (Yale).

454. Carver, A., Primary Identification and Mysticism. *Brit. J. of Med. Psychol.*, 1924, **4**, 102–114.

The unconscious motivation of the mysticism of a young man, whose history is given in detail, is most understandable as a regression to that stage of existence described by Burrow as the stage of primary subjective identification. Through retrospective falsification sexual factors came to play a prominent part in the developed neurosis. J. E. Anderson (Yale).

455. Hill, J. C., Poetry and the Unconscious. *Brit. J. of Med. Psychol.*, 1924, **4**, 125–133.

Specimens of poetry written by a student are given. A study of his life and of the poems show that the student's best poetry is a product of the Dream mind (the Unconscious). The poetry which he writes by conscious effort lacks the true poetic quality which that written semi-consciously or spontaneously possesses. The presence of a complex on the subject seems to be an important factor in the production of a poem and in the appreciation of a poem. The poet does not always understand the meaning of his own poetry, although it has meaning. J. E. Anderson (Yale).

456. Glover, E., The Significance of the Mouth in Psycho-Analysis. *Brit. J. of Med. Psychol.*, 1924, **4**, 134–155.

A detailed study from a psychoanalytical viewpoint of the relation between early oral activities and the development of the character of the individual is followed by a brief description of the abnormalities in which the mouth plays a part. J. E. Anderson (Yale).

457. Tansley, A. G., Critical Notice of Versuch einer Genitaltheorie, von Dr. S. Ferenczi. *Brit. J. of Med. Psychol.*, 1924, **4**, 156–161. J. E. Anderson (Yale).

458. Ruckmick, C. A., Experiences During Learning to Smoke. *Amer. J. of Psychol.*, 1924, **35**, 402–406.

During the first attempt to smoke, organic and kinesthetic sensations were prominent and somewhat unpleasant. Relaxation developed at once, at first as dizziness and a slight incapacity for adequate motor coördination, later becoming a reduced motor tonicity. There was no ideational confusion. The unpleasant features of the experience were practically removed after the third attempt. G. J. Rich (Chicago, Ill.).

9. NERVOUS AND MENTAL DISORDERS

459. Carswell, J., Some Sociological Considerations Bearing upon the Occurrence, Prevention and Treatment of Mental Disorders. *J. Ment. Sci.*, 1924, **70**, 347–357.

Statistics show that the number of first attacks of insanity in proportion to the population remained stable from 1901 to 1913. This is true for both men and women and for age groups from fifteen to forty-five years and over forty-five years. The percentage is much higher in the latter group for both men and women. The further analysis of these statistics does not show clearly that insanity is merely a product of social conditions or that it is independent of these. S. W. Fernberger (Pennsylvania).

460. Suttie, I. D., Moral Imbecility. *J. Ment. Sci.*, 1924, **70**, 362–375.

The author believes that the moral imbecile may be of two sorts: (1) those in whom the "social sentiments are imperfectly developed" and (2) those in which "they appear ineffectively articulated with every-day." S. W. Fernberger (Pennsylvania).

461. Watson, H. F., and Gibson, G., Sporadic Cretinoid Amentia. *J. Ment. Sci.*, 1924, **70**, 423–425.

Report of three cases in the same family, the parents of whom are closely related. Treatment is of interest as one of the cases

started to grow at twenty-four years and is still growing at twenty-seven years of age. S. W. FERNBERGER (Pennsylvania).

462. McKERROW, J. C., Neuroses. *Brit. J. of Med. Psychol.*, 1924, 4, 85–101.

Life is a continuing physico-chemical activity whose manifestations cannot be described in terms of physics and chemistry only. It tends toward a viable equilibrium which is not merely that of physical or chemical activity. This equilibrium must clearly vary in individuals according to the conditions in which their lot is cast. Normal individuals are such as are of normal stock and have lived under normal external conditions, intra-uterine and extra-uterine, physical, emotional and social. Their standard of viable equilibrium, in respect to all possible relevant conditions is the normal one for the species. Neuroses are the effects of deviation from the normal standards of viable equilibrium, degeneracies, aberrant manifestations of life activity. J. E. ANDERSON (Yale).

463. CONNELL, E. H., The Significance of the Idea of Death in the Neurotic Mind. *Brit. J. of Med. Psychol.*, 1924, 4, 115–124.

The conception of the death tendency in neurotics may be summarized: psychologically, as a psychic tension from failure of investment of the objects of perception with instinct interest and failure of instinct interest on invested psychic substitutes for perceived objects, so that the excitement cannot find outlet in real ends or in substituted or imagined ends; physiologically, as a change in the balance between the hormones or autocoids which, acting through the nervous system, keep the organism adjusted to external and internal stimuli; biologically, as a failure in the activity of one of the two great tendencies in the animal organism, a tendency essential to life and to adjustment to the environment. J. E. ANDERSON (Yale).

464. SALMON, T. W., Presidential Address. *Amer. J. Psychiat.*, 1924, 4, 1–11.

Dr. Salmon discusses the relation between psychiatry and the general medical sciences, their early identity, schism, and recent tendency towards union. For many years there has existed what Meyer calls "a deadly parallelism between mind and body" as if they existed apart from each other. Certain forces now tend to bring them together, such as mental hygiene in its relation to general pre-

ventive medicine, the common interests of medicine and psychiatry, in the war problems of psychoneuroses and examination of the draft army, and in the problems of the Veterans' Bureau. Moreover there is a growing tendency to approach the study of disease as a whole. Even in infectious diseases the medical profession is emphasizing constitutional factors. In New York at the "constitution clinics" researches are in progress to determine the constitutional factors in pernicious anemia and gastric ulcer. In order to further this beneficial union there should be better opportunities for clinical study in psychiatry in medical schools. A state hospital might well become the scientific medical center of its district. A. L. Gould (Boston Psychopathic Hospital).

465. Barker, L. F., Psychiatry and Public Health. *Amer. J. Psychiat.* 1924, **4**, 13–27.

Biology has transformed the conceptions of public health and psychiatry by stressing the unique nature of each human being. When the reactions of the human being correspond to his biological needs he is healthy. In its larger aspects public health must treat those problems involved in maintaining healthy individuals by controlling the conditions of human life to increase happiness and efficiency. Psychiatry can help to recognize and treat and prevent human maladjustments, but beside this the search for causes in inheritance factors or the environment must be stressed. The relation of disposition and constitution and exopathic influences to mental disease must be studied; eugenic studies and programs to safeguard the stock should go hand in hand with education of the affective and conative functions and an attempt to solve the inner conflicts of youth early. There should be as part of a program of public health a cautious, empirically sound, scientifically grounded therapy. A. L. Gould (Boston Psychopathic Hospital).

466. Looney, J. M., A Biochemical Study of the Blood in Mental Disorders. *Amer. J. Psychiat.*, 1924, **4**, 29–39.

There are no essential differences in the figures for the various nitrogenous constituents of the blood from the control group and from the hysterical psychoneurotic, manic or paranoid cases. In the depressed groups including the manic-depressive depressions, the simple and deteriorating precox, and the involutional melancholias there is an increase in the per cent of undetermined nitrogen and in

the last two of this group also a decrease in the per cent of creatine nitrogen. There is some evidence pointing to the view that toxic amines are present in the blood of markedly depressed cases and that the amount of creatine in the blood is related to the tonicity of the muscles. A. L. Gould (Boston Psychopathic Hospital).

467. Gibbs, C. E., Sexual Behavior and Secondary Sexual Hair in Female Patients with Maniac-Depressive Psychoses, and the Relation of These Factors to Dementia Praecox. *Amer. J. Psychiat.*, 1924, **4**, 41–56.

"1. Observations are reported on 107 patients with recovery from two or more attacks. 2. Masculine pubic hair and mammary hair occurred with much less frequence, in those patients than in those with dementia precox, and with only a slightly greater frequency than in nonpsychotic pregnant women. 3. In certain cases a close relation was found to exist between the character and adequacy of the previous sexual behavior, the age of onset of the psychosis, and the occurrence of the masculine types of hair growth." In female patients with psychotic reactions having certain benign aspects, who also have a history of inadequate or peculiar sex behavior, early onset of psychosis and masculine hair the outcome is likely to be unfavorable and the process malignant and not easily differentiated from dementia precox. A. L. Gould (Boston Psychopathic Hospital).

468. Boltz, O. H., A Case of Manic-Depressive Reaction with Psychic Impotence. *Amer. J. Psychiat.*, 1924, **4**, 59–75.

The author reports a psychoanalytic study of the symbolism of the dreams and rationalizations of a case of psychic impotence followed by depression and later hypomania. He interprets their relation to incest fantasies, masturbation and repressed homosexuality in the patient. The conflict remains the same but the picture is different in the manic and depressive phases; pseudo-omnipotence and elation succeed impotence and depression in the course of the disease. A. L. Gould (Boston Psychopathic Hospital).

469. Sullivan, H. S., Schizophrenia: Its Conservative and Malignant Features. A Preliminary Communication. *Amer. J. Psychiat.*, 1924, **4**, 77–91.

Among psychiatrists there is either a tendency to absolute pessimism or humble optimism regarding the outcome of schizophrenia.

The element of motivation is fundamental to the understanding and treatment of the disease. Three conceptions have been developed which are essential in the interpretation of schizophrenic states: Freud's "unconscious", Nunn's hormic energy, or Jung's libido, and the genetic hypothesis of mental structure and functions. Interpretations and suggestions must not be thrust upon a patient without a detailed, careful regard for the entire situation. There can be no lasting stability unless the new adjustment is made to the extra-institutional environment of the patient. The malignant states are those hebephrenics who lose egoistic strivings and develop mannerisms together with frank execretory interests. The author takes a more optimistic attitude towards catatonic states and early schizophrenic states in general where the regressions to infantile thought processes have led to dissociation of the individual to external social and personal reality but not to infantile behavior. Clinical history shows that some cases of schizophrenia recover with favorable changes in the personality. A. L. Gould (Boston Psychopathic Hospital).

470. Hubbard, L. D., Report of a Case of Benign Stupor Showing Unusual Ideational Content. *Amer. J. Psychiat.*, 1924, **4**, 93–102.

The case is reported in detail over a period of several years with the following conclusions: this regressive psychosis developed in an inadequate personality with masochistic tendencies and was precipitated by somatic conditions. During the lighter stage of the stupor the patient spent much of her time doing mental arithmetic which was a way of triumphing over her father whom she disliked and in working out her own ambition to teach mathematics. After her mental recovery there was no return of psychotic symptoms even with the onset of severe somatic symptoms which caused her death. A. L. Gould (Boston Psychopathic Hospital).

471. Mills, G. W. T., A Report on Some Heredity Studies. *Amer. J. Psychiat.*, 1924, **4**, 103–123.

The author first reviews papers on the heredity of mental disease by Rosanoff, Myerson, White, and Clark and Atwood. He then presents heredity charts for 18 cases admitted to a state hospital in which there were some positive statement of heredity in the commitment paper. The only selection made was on the basis of the accessibility of relatives. Only two of these cases were found to fit in with

the Mendelian laws which does not confirm previous reports that psychoses behave as recessive traits which statement the author does not regard as founded on facts. A. L. Gould (Boston Psychopathic Hospital).

472. Russell, W. L., A Chapter From the Evolution of the Medical Administration. *Amer. J. Psychiat.*, 1924, **4**, 125–133.

The greatest change in the administration of the hospital for the insane has been the extension of the influence and authority of the physician from the strictly medical administration to the moral and executive as well. It has become a recognized fact that the treatment of the mind and body of the patient must be in the same hands. The advances in methods of examining the mind have been so great that the technic of psychiatry is not now inferior in system and precision to that of other branches of medicine. A. L. Gould (Boston Psychopathic Hospital).

473. Clark, S. M., The Relation of Absence of the Sentiments As Outlined by Shand to Some Cases Labelled Psychopathic Personality. *Amer. J. Psychiat.*, 1924, **4**, 135–142.

A case of psychopathic personality is reported with a discussion to determine some criterion for such cases. The author gives a lack of aim as the chief characteristic of the life history reported. There were no overstrong appetites or instincts to be combated nor were there well-developed sentiments to dominate his conduct. This weakness or absence of sentiment marks the psychopathic personality as one lacking in social development. A. L. Gould (Boston Psychopathic Hospital).

10. INDIVIDUAL, RACIAL AND SOCIAL PSYCHOLOGY

474. Galant, J. S., Die Fragebogenmethode bei der Untersuchung tätowierter Verbrecher, Beitrag zur Psychologie des Tätowierens und der tätowierten Verbrecher. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 31–38.

Das Tätowieren ist nicht bloss als *Folge* bestimmter Geistesverfassungen (allerdings nicht notwendig einer verbrecherischen) aufzufassen, sondern vielleicht auch als *Ursache* für die Entwickelung schlechter Charaktereigenschaften und Neigungen, besonders—durch Steigerung der Libido—für die Entstehung sexueller Ver-

brecher. Der Verfasser schlägt vor, an der Hand eines von ihm ausgearbeiteten Fragebogens zu untersuchen, von welchem Einfluss die Tätowierungen auf das Denken und Handeln der einzelnen Untersuchten ist, und besonders, ob die Tätowierungen einen Stimulus für die Ausübung eines Verbrechens bilden. Wäre das der Fall, so wäre auch ein gesetzliches Verbot der Tätowierungen am Platze. O. Lipmann (Berlin).

475. Hellwig, A., Zur Bestrafung Jugendlicher. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 29–31.

Auch Jugendliche im 12. und 13. Lebensjahre haben selten die zur Erkenntnis der Strafbarkeit eines Diebstahles erforderliche Einsicht. Das Mass dieser Einsicht abzuschätzen, ist nur der mit der Psyche des Jugendlichen vertraute, mit dem Vormundschaftsrichter in der Regel identische Jugendrichter imstande, dem daher die Vorermittelungen gegen Jugendliche und ebenso die Vernehmung Jugendlicher (als Beschuldigte oder als Zeugen) zu übertragen sind. Bei Hilfsschülern wird sich zum mindesten die gutachtliche Vernehmung ihres Lehrers oder des Schularztes empfehlen, da bei Hilfsschülern stets damit gerechnet werden muss, dass die geistige Reife nicht vorhanden ist. O. Lipmann (Berlin).

476. Grünthal, E., Ein Fall von Leichen Fetischismus. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 38–43.

Wir haben es bei einem äusserlich ziemlich normal aussehenden Geschlechtsleben mit den Resten einer kindlichen Stufe der Geschlechtsentwickelung zu tun. Zugleich ist aber der in der Kindheit-durch äussere Umstände bedingte—als gesclechtlicher Reiz wirkender Anblick schön geschmückter, aufgebahrter Frauenleichen lebendig und mit dem Akte der Selbstbefriedigung verbunden geblieben. O. Lipmann (Berlin).

477. Raecke, Simulation geistiger Störungen. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 50–58.

Es ist falsch, Simulation als Zeichen geistiger Abwegigkeit zu betrachten. Auch Normale können längere Zeit hindurch selbst Fachärzten gegenüber das Bild einer Psychose vortäuschen. Simulationsversuche sind besonders bei Kriminellen garnicht selten; allerdings sind die wenigsten so erfolgreich, dass sie die Aufnahme in psychiatrische Anstalten veranlassen. Der Verfasser behandelt dann die Abgrenzung der Simulation gegenüber chronischen Geistes-

krankheiten (Imbezillität, Paralyse, Dementia praecox) und gibt zum Schluss einige Anweisungen, wie der Arzt sich gegenüber einem vermeintlichen Simulanten verhalten soll. O. LIPMANN (Berlin).

478. MICHEL, R., Zur Psychologie und Psychopathologie der Strafhaft. *Monatsschr. f. Kriminalpsychol.*, 1924, 15, 58–83.

Der Verfasser hat 355 Sträflinge (Schwerverbrecher) eingehend untersucht. Die meisten waren dauernd in depressiver Stimmung, wollten allein sein und über ihr Schicksal nachgrübeln, litten an Heimweh. "Verschlagenheit, Trotz, Verlogenheit, Heuchelei und Faulheit sind die Kardinaleigenschaften des Verbrechers," ferner Rauchsucht. Korpsgeist ist nur bei wenigen zu finden. Die meisten sind krasse Egoisten, "was wohl mit der durchschnittlich geringen Intelligenz zusammenhängt." Der sogenannte Eliteverbrecher ist stark ichbetont und eitel. "Die Erregbarkeit und Reizbarkei der Verbrecher ist enorm." Hypochondrie und Querulantentum sind häufig; sie sind durch die starke Icheinstellung bedingt.—Das reliöse Gefühl der Sträflinge ist gering. "Die Führung in der Haft ist den meisten ziemlich gut." "Die Gewohnheitsverbrecher, bei denen in der Mehrzahl Arbeitsscheu ein Hauptmerkmal ist, verlangen in der Anstalt nach Arbeit." Die sexuelle Abstinenz wird von sehr vielen, auch jungen Sträflingen nur wenig empfunden. Schwerer wird im allegemeinen das Rauchen vermisst. "Die Arbeitsfreie Zeit verbringen die meisten stumpfsinnig." (Hier werden einige ziemlich belanglose Proben von Dichtungen eingefügt)—"Als Verkehrssprache ist unter den Sträflingen die Gaunersprache sehr verbreitet," die aber in der Freiheit nur von einem geringen Bruchteil der Verbrecher gesprochen wird. "Bei den zu längerer Haft verurteilten sind die Gedanken auf Entweichung gerichtet." "Auch Selbstmordversuche sind nicht selten, von denen meiner Ueberzeugung nach aber viele nicht ernst gemeint, sondern nur auf Effekt berechnet sind." Von den zu lebenslänglicher Kerkerstrafe verurteilten arbeiteten die meisten fleissig; die Hälfte von ihnen fiel durch eine grosse Abschwächung, Stupidität auf, und es kann wohl keinem Zweifel unterliegen, dass die lange Haft bei den meisten einen Abbau der intellektuellen Fähigkeiten bewirkt. Ein grosser Teil der in den Strafanstalten befindlichen Gewohnheitsund Berufsverbrecher ist geistig minderwertig, und von diesen reagieren viele infolge ihrer geistigen Widerstandskraft gegenüber aüsseren Einflüssen in schwerer Weise auf die Strafnoxen. Viele Sträflinge hatten eine 3 Jahre währende Einzelhaft gut vertragen und erklärten, die

Einzelhaft der Gemeinschaft vorzuziehen. Viele aber ertragen die Einzelhaft schwer, besonders im Anfang. Erstbestrafte, die nur in Einzelhaft ihre Strafe abbüssen, werden seltener rückfällig. Die Strafschäden äussern sich vorwiegend in funktionell nervösen Störungen. Die meisten Sträflinge schlafen sehr unruhig und träumen sehr lebhaft, meistens von Verbrechen im allgemeinen, nur verhältnismässig selten von dem eigenen begangenen Verbrechen. "Bei den psychopathisch Minderwertigen besteht ziemlich oft eine haftpsychotische Disposition, auf deren Boden es dann unter dem Einflusse der Strafnoxen zum Ausbruche einer Geisteskrankheit, sei es einer transitorischen, sei es einer chronischen kommen kann." (9 kurze Krankengeschichten). "Einwandfreie Simulation von Geisteskrankheit habe ich während meiner Arbeitszeit in der Strafanstalt nicht gesehen." Von den 355 Sträflingen erschien bei 44 (meist Affekt- oder Augenblicksverbrechen) nach ihrer charakterologischen Artung und ihrem Verhalten in der Strafanstalt eine bessernde Strafwirkung wahrscheinlich, d. h. ein Rückfall unwahrscheinlich. 172 behaupteten, Besserungswillen zu haben: doch erschien dies bei den meisten ziemlich unglaubwürdig. Viele geben unumwunden zu, dass sie wieder Verbrechen begehen werden. "Die Einsicht für das Strafbare der verbrecherischen Handlung ist bei den meisten sehr gering, aufrichtige Reue ist sehr selten, Leugnen der Schuld häufig. Die Rückfallstatistik zeigt, dass man den Erfolg der Strafe nur sehr gering einschätzen darf. . . ." Der Verfasser zieht zum Vergleich mit seinen Beobachtungen sehr zahlreiche Beobachtungen anderer Autoren heran. Der Arbeit ist ein 74 Arbeiten aufzählendes Literaturverzeichnis angefügt. O. Lipmann (Berlin).

479. Zirker, Erste Tagung der Arbeitsgemeinschaft für Reform des Strafvollzugs am 18 und 19 Januar 1924 in Eisenach. *Monatsschr. f. Kriminalpsychol.*, 1924, **15**, 102–105.

Von besonderem Interesse ist hier die 4 der von der Tagung angenommenen Thesen: "Strafanstaltsbeamte müssen unter dem Gesichtspunkte Ohne pädagogisch besonders geschulte Erzieher (Fürsorger") ist ein wirksamer Strafvollzug, insbesondere in Führungsstufen, nicht durchführbar. In jeder Strafanstalt, vor allem in Jugendgefängnissen, kann wirksame Erzieungs arbeit nur geleistet werden, wenn ein einheitlicher pädagogischer Geist alle Beamten vom Leiter bis zum letzten Aufseher beherrscht!" O. Lipmann (Berlin).

480. Ohrloff, E., Weibliche Fürsorgezöglinge. *Päd. Mag.*, 1923, 935, 56.

Neben den bisher bekannten Ursachen der weiblichen Verwahrlosung glaubt der Verfasser auch einen Einfluss der Tuberkulose auf die sittliche Entwicklung feststellen zu können. H. Bogen (Berlin).

481. Gruhle, H. W., Anregungen zur Charakterforschung. *Z. f. Kinderforsch.*, 1924, **28**, 305–314.

G. stellt ein bestimmtes Schema auf, das es ermöglicht, jedes einzelne einer Gruppe angehörige Individuum kurz zy analysieren. Neben 24 gegensätzlichen Eigenschaftspaaren werden noch solche Kombinationen der Eigenschaften gegeben, die im menschlichen Leben häufiger auftreten. G. glaubt damit Gruppenvergleiche exakt ausführen lassen zu können, z. B. Untersuchungen über den Charakter verschiedener Volksstämme. H. Bogen (Berlin).

482. Nohl, H., Die Ausbildung der Sozialpädagogen durch die Universität. *Z. f. Kinderforsch.*, 1924, **29**, 5–11. H. Bogen (Berlin).

483. Seashore, C. E., Recognition of the Individual. *Science*, 1924, **60**, 321–325.

A plan is outlined for the maximum individual treatment of the student possible in the face of the mass education necessary in large schools of engineering. The program involves the selection of students by a college qualifying examination; their placement by departmental examinations; sectioning of classes on the basis of ability; guidance of the individual by providing natural terminations of the technical course at various levels of achievement; motivation by assignments spread in proportion to the spread of capacity; and socialized forms of reward. G. J. Rich (Chicago, Ill.).

11. MENTAL DEVELOPMENT IN MAN

484. Michaelis, A., Die psychischen Erscheinungen der Adolescenz. *Z. f. päd. Psychol.*, 1924, **25**, 147–155.

Es werden die trotz des Erscheinungsreichtums erkennbaren typischen allgemeinen Strukturen der Adolescenz herauszuarbeiten versucht. Die A. stellt sich als eine Periode der Verfestigung und

Ineinssetzung, der endgültigen Ausprägung des einheitlichen psychophysischen Ganzen dar. Es fehlt noch die Stetigkeit und Einseitigkeit der Produktivität des Erwachsenen. Die Rückkehr aus der Ichwelt des Pubertierenden in die reale Umwelt macht die A. zu einer bedeutungsvollen Uebungsperiode. In sexueller Hinsicht tritt dem Körperlichen Kontrektationsbedürfnis folgend der Detumscenztrieb immer stärker in den Vordergrund. In der ohne besondere Erschütterungen erfolgenden Vereinigung aller Triebrichtungen wächst dann die Möglichkeit des vollen Liebeserlebnisses heran. Milderung der Kritiksucht des Pubertierenden, Abkehr von theoretischen, meist stark auf das eigene Ich bezogenen Spekulationen, einfühlendes Verständnis für fremde Anschauungen, Aufnahme früher abgelehnter geistiger Inhalte in die eigenen idealen Störmungen führen zur Zusammenfügung von Welt und Denken, zür Weltanschauungsbildung. Das Gefühlsleben zeigt sich von tatfroher Romantik beherrscht, die sich auf die Verwirklichung lebenspraktischer Ideale richtet. Die häufige Ueberschätzung der eigenen Kraft führt noch zu Rückschlägen, die den Jugendpessimismus der 18–20 jährigen hervorrufen. Nach Ueberwindung auch dieser Epoche tritt erst die echte Produktivität ein und damit die Stetigkeit und Reife des Gefühlslebens. In der ethischen Entwicklung wird die Vorherrschaft des Ichgefühls überwunden durch das heranreifende Persönlichkeitsbewusstsein und das Gemeinschaftserlebnis. Die zu nehmende Festigung der Psyche des Adolescenten, das darauf beruhende Gefühl der Selbstsicherheit und der engen Verbindung mit dem realen Leben ermöglicht nun auch jene zum ästhetischen Erleben notwendige persönliche Uninteressiertheit. H. Bogen (Berlin).

485. Schulte, R. W., Die Rolle des Beobachtungsbogens bei der Auslese der Begabten. *Päd. Mag.*, 1923, **926**.

Betont die Notwendigkeit psychologischen Denkens in der gesamten pädagogischen Praxis. Unterbreitet einen neuen Schülerbeobachtungsbogen. H. Bogen (Berlin).

486. Leemann, L., Die sittliche Entwicklung des Schulkindes. *Päd. Mag.*, 1923, **937**, 124.

Die Untersuchung basiert auf Schülerarbeiten, in denen eine Reihe auf ein sehr kindertümliches Bild bezüglicher Fragen zu beantworten waren. Es lassen sich Stufen der sittlichen Entwicklung

mit einer gewissen Vorsicht herausstellen. In den frühesten Schuljahren unterliegt das Kind dem Zwang der Situation, ihrer suggestiven Wirkung. Später drängen sich allgemeine Ueberlegungen dazwischen. Mit dem 11. Lebensjahr etwa entwickelt sich das rechtigkeitsgefühl, im 13. etwa das Verantwortungsgefühl. In dieser Zeit ist das Kind auch erst in der Lage, sich in von verschiedenen Gefühlen beseelte handelnde Personen leichzeitig einzufühlen. H. Bogen (Berlin).

487. Siegmund-Schultze, F., Ausbildungsfragen der Jugendwohlfahrt mit besonderer Berücksichtigung der Psychopathenfürsorge. *Z. f. Kinderforsch.*, 1924, **29**, 1–4. H. Bogen (Berlin).

488. Kramer, F., Eingliederung des Unterrichts über Psychopathologie des Kindes- und Jugendalters in das akademische Studium. *Z. f. Kinderforsch.*, 1924, **29**, 12–13. H. Bogen (Berlin).

489. Francke, H., Die Ausbildung der Jugendrichter. *Z. f. Kinderforsch.*, 1924, **29**, 14–16. H. Bogen (Berlin).

490. Leyen, R. v. d., Die Eingliederung der Psychopathenfürsorge in die Ausbildung der Jugendwohlfahrtspflegerinnen. *Z. f. Kinderforsch.*, 1924, **29**, 17–23. H. Bogen (Berlin).

491. Gregor, A., Ausbildungsfragen im Bereich der Anstaltsfürsorgeerziehung. *Z. f. Kinderforsch.*, 1924, **29**, 24–29. H. Bogen (Berlin).

492. Herrmann, W., Die pädagogische Ausbildung von Strafvollzugsbeamten an Jugendgefängnissen. *Z. f. Kinderforsch.*, 1924, **29**, 30–35. H. Bogen (Berlin).

493. Kroh, O., Die eidetische Anlage bei Jugendlichen. *Z. f. Kinderforsch.*, 1924, **29**, 63–74.

Kurze Darstellung der bisherigen grundlegenden Kenntnisse über das Wesen der eidetischen Entwicklungsphase, die besonders auf die Wirkung des Anschauungsbildes auf die Entfaltung der Persönlichkeit hinweist. H. Bogen (Berlin).

494. Lyon, E., Heilpädagogisches Erholungsheim. Ein Beitrag zur Typenbildung psychopathischer Jugendlicher. *Z. f. Kinderforsch.*, 1924, **29**, 75–98.

Das neugegrundete Heim soll Erholungsmöglichkeit für solche Kinder schaffen, deren Unterbringung in ein Heim für normale Kinder nicht möglich oder nicht zweckmässig ist, bei denen man sich aber von einer vorübergehenden Erholung Erfolg versprechen kann und eine dauernde Entferhung aus dem Elternhause nicht notwendig erscheint. Es sind hauptsächlich drei wirksame Faktoren erkennbar: (1) Die körperliche Erholung; (2) die Milieuveränderung und vorübergehende energische Disziplinierung; (3) die Entspannung zwischen Eltern und Kind. Eine gut ausgewählte Kasauistik mit genauer Symptomatologie und Therapie ist beigegeben. Im Heim finden hauptsächlich zwei Typen Aufnahme, die überlebhaften und die überempfindlichen Psychopathen. Die Einordnung eines Psychopathen in einen Typus gibt nur die grobe Charakterisierung des Falles, seine erziehliche Behandlung im Heim kann sich nur auf eingehendes Studium der Individualität gründen. H. Bogen (Berlin).

495. Thumm, M., Zwei Jahre poliklinischer Beratungsstelle beim Jugendamt Leipzig. *Z. f. Kinderforsch.*, 1924, **29**, 99–112.

Die Beratungsstelle dient der prophylaktischen Erfassung gefährdeter Jugendlicher. Verf. unterbreitet die Fälle der ersten zwei Jahre nach systematisch-klinischen Gesichtspunkten. Ziel der Beratungsstelle wie aller psychiatrischen Jugendfürsorge überhaupt muss es sein, für die Zukunft zu erreichen, dass 1. alle Bedürftigen möglichst frühzeitig von der "offenen" Fürsorge erfasst werden, die allein prophylaktisch zu wirken vermag, und 2., dass kein Fürsorgeerziehungsbeschluss ergeht ohnne psychiatrische Mitwirkung. H. Bogen (Berlin).

496. Bühler, C., Die Kinderlüge. *Z. f. Kinderforsch.*, 1924, **29**, 113–116.

Einigen hundert 7–11 jährigen Volksschülern wurde die Frage: "Gibt es Fälle, in denen man lügen muss?" zur schriftlichen Beantwortung vorgelegt. Das erhaltene Material wurde aufgegliedert in soziale, asoziale und antisoziale Lügen. Etwa 38 per centum der Kinderlügen sind Erwachsenenlügen, in weiteren 10 per centum der Fälle waren Erwachsene die Anstifter zur Lüge. Etwa 50 per

centum aller Lügen sind asozial. Im frühen Schulalter steht die soziale Lüge im Vordergrund. Zu Beginn und in der Pubertät macht sich die antisoziale Lüge breit. Zurückgebliebene Schüler, welche heilpädagogisches Interesse beanspruchen konnten, zeigten diese Einstellung in weit stärkerem Grade, jedoch sind Erwachsenenlügen bei ihnen nur noch selten. Das dürfte zum Teil in ihrer gegnerischen Einstellung zum Erwachsenen während der Pubertätszeit liegen, zum Teil aber auch in der Notwehrlage, in der sich der geistig Schwache befindet. H. Bogen (Berlin).

497. Fürstenheim, Ueber den Zusammenhang der geisteswissenschaftlichen und naturwissenschaftlichen Jugendsichtung. *Z. f. Kinderforsch.*, 1924, **29**, 117–130.

Verf. betont gegenüber den Unterschieden, welche beide Forschungsrichtungen immer gegeneinander hervorkehren, das gemeinsame, das beide einschliessen. Die Jugendsichtung bedarf beider Forschungsrichtungen. Bildschöpferisch, als Eidoplasie (beschreibende Jugendkunde) hat die geisteswissenschaftliche Erfassung die genaue Kenntnis des Seeleninhalts und der körperlich-seelischen Anlagen zu verschaffen. Die Untersuchung der Entstehung eines solchen Gesamtbildes mit dem Zile der Herausschälung der Veranlagung ist Sache der Bilddeutung, der Aitiolyse (deutende Jugendkunde). Die doppelseitige Betrachtung gilt nicht nur für Einzelwesen, sondern auch für räumliches Nebeneinander von Gruppen, wie für das zeitliche Nacheinander von Folgen oder Phasen. Hinter ähnlichen Gesamtleistungen können sich ganz verschiedenartige Veranlagungen verbergen; ähnliche Veranlagungen können unter verschiedenen Verhältnissen zu verschiedenartigen Gesamtbildern und Gesamtleistungen führen. Es besteht Wechselwirkung zwischen Seeleninhalt und Seelenanlage. Die Seelenanlage wirkt strukturierend auf den Seeleninhalt ein, der Seeleninhalt formend auf die Seelenanlage zurück. Diese Umformung erstreckt sich zunächst nur, d. h. im Einzelleben, auf einzelne Seelenanlagen. Ihr Beziehungsgesetz, eben die Struktur, ändert sie nicht. Sie regelt vielmehr als ein Umwandlungs- oder Entwicklungsgesetz die Veränderungen des körperlich-seelischen Erschienungsbildes unter umformenden äusseren Einflüssen. Sie heisst in allgemeinster Form auch die "Konstitution des Organismus." H. Bogen (Berlin).

498. Haase, E., Die Grundlagen der sozialen Gesinnung in der kindlichen Spielgesellschaft. Ein Beitrag zur staatsbürgerlichen Erziehung der Jugend. *Päd. Mag.*, 1924, **977**, 82.

Die Arbeit ist mit ihren umfangreichen Umfragen und Aussagen ein wertvoller Beitrag zur Psychologie des Kinderspieles. Die Analyse ist nach den vier Hauptgruppen von sozialen Tugengenden: Einfügung des Einzelnen in das Ganze der Gesellschaft, Rechtliche Denkweise, Brüderliche Gesinnung und Streben nach Vervollkommung erfolgt, denen eine ausführlichere Motivierung untergeordnet ist. Ausblicke auf die Geschlechterfrage und den Erwachsenen sind am rechten Platze herangezogen. Dass das Spiel bei Kindern von einem gewissen Alter fruchtbare Keime auch nach der Seite der staatsbürgerlichen Erziehung enthält, ist einleuchtend. F. W. Schroeder.

499. Rehmke, J., Gemüt und Gemütsbildung. *Päd. Mag.*, 1924, **974**, 38.

Der einstige Greifswalder Professor weist eine besondere Struktur auf, die auch zur Gründung einer Gesellschaft und einer von ihr herausgegebenen Zeitschrift geführt hat. Die Gedanken der Abhandlung liegen bereits in den betr. Kapiteln seines Lehrbuches der allgemeinen Psychologie und seiner "Lehre vom Gemüt" vor. Die Gemütsbildung selber ist etwas zu kurz weggekommen. F. W. Schroeder.

500. Weiss, G., Reichsverfassung und Arbeitsunterricht. *Päd. Mag.*, 1924, **770**, 32.

Der Jenenser Professor beabsichtigt damit die Auffassung vom Arbeitsunterricht näher zu kennzeichnen, die die Bestimmung über ihn in der Reichsverfassung nach den Worten der Gesetzgeber haben soll, sodass die erste Aufl. gelegentlich ein kritischer Kommentar zu Artikel 148 Abs. 3 genannt worden ist. So verdankt das ungeheure Schrifttum, das inzwischen darüber erschienen, sicher seinen Gedanken manche Anregung und Belebung. F. W. Schroeder.

501. Honigsheim, P., Soziologie, Staatswissenschaften und politische Gegenwartsprobleme in der Volkshochschule. *Päd. Mag.*, 1924, **973**, 30.

Immer noch brennend ist in Deutschland die Frage der Volkshochschule und ihres Ausbaus. Der Direktor der städtischen

Volkshochschule Köln steht mitten in der Bewegung. Diejenigen Gebiete der Sozial- und Gesellschaftswissenschaften wünscht er an ihr behandelt zu sehen, die am stärksten die weltanschaulichen Grundlagen und Gegensätze herauszuschälen ermölichen. Die methodischen Gefahren werden berührt und die Bedeutung dieser Disziplinen für die Gesamtkultur hervorgehoben. F. W. SCHROEDER.

502. LUCHTENBERG, P., Antinomien der Pädagogik. *Päd. Mag.*, 1923, **952**, 64.

Die "Antinomien" als heuristisches Prinzip und fruchtbare Einstellung erfreueh sich in Deutschland gegenwärtig auf cerschiedenen Gebieten umfangreicher Beachtung. Das Rüstzeug dazu, gediegenes Wissen, synthetisches Schauen, geistvolle Beherrschung der Sprache besitzt der Verf, Er stellt methodische Antinomien mit den Unterabteilungen: Kulturkrisis und Pädagogik, Pädagogik als Wissenschaft, Dualismus und Monismus der Methode der Pädagogik, und teleologische Antinomien mit den Abteilungen: Pädagogik als "Entbindung von" und "Bindung an," Individuum und Gemeinschaft, und endlich Antinomien der Didaktik auf. Dass man bei derart weitschichtigen und tiefverwurzelten Materien über die Anordnung, die Gegenüberstellung, die Analyse, die Lösung und Schlichtung leicht anderer Meinung sein kann, liegt in der Sache begründet; für die Fülle der dargebotenen Anregungen aber muss man in jedem Falle dankbar sein. F. W. SCHROEDER.

503. HEYWANG, E., Was ist Arbeitsschule? Antwort in Lehre und Beispiel. *Päd. Mag.*, 1924, **968**, 82.

Die pädagogische Welt steht gegenwärtig im Zeichen der Arbeitsschulidee. Naturgemäss müssen bei extremer Einstellung und Verallgemeinerung auch ihre Bedingtheiten und Relativitäten sich fühlbar machen und Gegenströmungen erzeugen. Ein Ausgleich wird zu erwarten sein. Den theoretischen Auseinandersetzungen folgen vier Unterrichtsbeispiele, von denen die ersten drei im Einklang mit dem Prinzip der Arbeitsschulidee gehalten sind; das vierte, eine Gedichtsbehandlung, warmherzig und frisch geschrieben, betont mehr das Moment des Erlebens. F. W. SCHROEDER.

504. SALLWÜRK, E. v., Die Einheit des menschlichen Wesens. *Päd. Mag.*, 1924, **951**, 113.

S. stellt es sich zur Aufgabe zu untersuchen, "ob die Natur den Menschen so ausgestattet hat, dass er aus eigener Kraft zur Ent-

wicklung seines natürlichen Wesens und durch sie zur Kultur gelangen kann." Dementsprechend gilt ein grosser Teil dem Willen. Er hält daran fest, dass die Willensvorgänge nicht Wirkungen eines besonderen Seelenvermögens sind, sondern auf einer fortgehenden innigen Vereinigung von Gefühl und Gedanken beruhen. In dem zweiten Hauptabschnitt sucht er in einer ausführlichen Betrachtung der spielenden Betätigung des jugendlichen Menschen zu zeigen, dass " der Zwiespalt zwischen Natur und Kultur garnicht besteht." Zum Schluss stellt er die sich daraus ergebenden Zielforderungen. F. W. SCHROEDER.

505. RICHARDS, O. W., High Test Scores Attained by Subaverage Minds. *J. of Exper. Psychol.*, 1924, 7, 148–156.

" This paper shows how chance affects the use and scoring of the multiple response test. Tables are given showing the probability of a guesser obtaining any given score with a multiple response test of twenty-five items with either three or four alternatives. The relative accuracy, as affected by guessing, of the two, three and four alternative tests is compared. A scoring method and scales are presented taking into consideration the relative measuring value of the items according to how easily they could be marked right by the guessing procedure. A method is suggested whereby the guessing factor can be combined with other factors in preparing a more satisfactory and practical scoring method for this type of test." C. C. PRATT (Harvard).

506. WILSON, J. H., Comparison of Certain Intelligence Scales. *Brit. J. of Psychol.*, 1924, 15, 44–63.

Approximately 340 children were given five intelligence scales; the Terman Group, the Otis Group, the National, the Northumberland, and the Simplex. Detailed comparisons of the scales are made. In general it may be said that the British children score higher than the American norms for the corresponding ages. American scales correlate more highly with teacher's estimates and examination marks than do the British. Aside from the fact that the norms are too low, the author would rank the American scales as superior to the British, and among the American scales would rate them in this order, National A, Terman, and then Otis. J. E. ANDERSON (Yale).

507. WINCH, W. H., Should Poems be Learned by School Children as "Wholes" or in "Parts." *Brit. J. of Psychol.*, 1924, **15**, 64–79.

Experiments were performed on three different groups of school children from Standards V, VI and VII. In each group, the children were divided into two equal, parallel, and highly correlated groups, by pairing on the basis of a preliminary test, after which one group learned by the part method, the other by the whole method. In each of the three groups the "part" learners proved superior. J. E. ANDERSON (Yale).

508. GATES, A. I., The Nature and Educational Significance of Physical Status and of Mental, Physiological, Social and Emotional Maturity. *J. Educ. Psychol.*, 1924, **15**, 329–358.

This report is concerned with an analysis of the interrelation of physical and mental abilities; and also of maturity which includes the study of physical, mental, emotional, social and educational aspects. Two groups both containing boys and girls were chosen for the investigation. One group contained 57 pupils and the other 58 pupils. Since the results were worked up independently one was used as a check on the other. The measures used for evaluating these factors are divided into six groups. The first studies the anatomical traits: ossification of the wrist bones, height, weight, and chest girth. The second takes up the physiological functions: lung capacity, strength of forearm, index of nutrition, rate of heart beat, physical vigor, health and efficiency. The third delves into the emotional maturity and stability. The fourth attempts an estimation of social maturity. The fifth studies the interrelation between mental ability and maturity. The sixth step takes up the scholastic achievement of the pupils by means of the Stanford Achievement Test and Horace Mann Test in language and spelling. The data tends to disprove the work of Baldwin, Rotch and Woodrow concerning the significance of physical traits, the reasons being: first, although the correlations are positive they are variable; second, there is no high correlation between a physical measure and stamina, physical vigor, maturity, etc.; third, no physical trait is an index of such types of maturity as mental, scholastic, social, emotional or "general maturity." Setting aside these facts the authors classify the children into groups according to their similarities. G. M. MICHAELS (Columbia).

509. Miller, W. S., The Variation and Significance of Intelligence Quotients Obtained from Group Tests. *J. Educ. Psychol.*, 1924, **15**, 359–366.

That certain group tests have shown a variation in intelligence quotients has been demonstrated. This, then, sets a problem for those who use group tests as indices to equate the IQ's of the different tests. Here is taken into consideration the advisability of equating IQ's from 9 group tests and the problem of test validation. The material is composed of the Miller Mental Ability Form A, Haggerty Intelligence Examination Delta 2 (given June 10, 1922); Army Alpha Form 8, Illinois General Intelligence Scale Form 1, Terman Group Test of Mental Ability Form A (given April 9, 1923); Dearborn Group Test of Intelligence Series II-C (given April 10, 1923); Otis Self-Administering Higher Examination Form A (given May 12, 1923); Stanford-Binet Individual Test (given between March 1 and May 15, 1923). The results show the mental age norms to vary so much that it is impossible to interpret the IQ's from all group tests according to the S-B standard. By translating the IQ's into variability units (tenths of S.D. with zero at 5 S.D. negative) the direct comparison of some group tests by means of the IQ is greatly facilitated. G. M. Michaels (Columbia).

510. Franzen, R., Statistical Issues. *J. Educ. Psychol.*, 1924, **15**, 367–382.

In his long statistical discussion the author takes issue with various conceptions and assumptions among which is the work of the author himself. The inquiry into commensuration and age "is directed against the assumption that a translation of scores into mental age and educational ages makes them comparable." It is not only important to know where the child stands in relation to the age means on a growth curve, but in relation to the spread around those means which takes into account overlapping of a particular test. A mental age of fourteen and a reading age of twelve can indicate similar proficiency on both tests if these tests correlate differently with age. The reliability of the differences between intelligence and educational ratings is best obtained by the use of the formula $\Theta_d = (2-r,-r_2)^{1/2}$. The only apparent use of $\frac{\Theta}{m}$ in the measurement of human abilities *is as a location of zero,*

and not a measure of comparative variability when the zeros are not located. $\sqrt{1-r}$, is the proper medium for the judgment of reliability. G. M. MICHAELS (Columbia).

511. HERRING, J. P., Avery's Comparison of the Stanford and Herring Revisions. *J. Educ. Psychol.*, 1924, **15**, 383–388.

Everything depends on the interpretation of the correlations which are affected by the dispersion of the group measured. The correlations as obtained by Avery may be due to their selection. If he had tested in the selected grades with a range equivalent to the unselected twelve-year-old groups his results would have been different. Another very important factor is the manner in which the test is given. The reliability coefficients vary according to the one who gives the test; these fall into three distinct classes. First there are the correlations obtained by the author of the test; second, correlations obtained by those trained by the author; third, correlations obtained by those not trained by the author. To reduce these differences to a minimum the following good advice is given. Do not allow more than two weeks to elapse between the giving of the Stanford and the Herring Tests. Be sure there are no errors in the manual. If the difference is greater than four months the difference should be looked into. Practice such as this will help to keep the S.D. well within four months. G. M. MICHAELS (Columbia).

512. PIÉRON, MME. H., Étude Psychotechnique de Quelques Tests. *L'Année Psychol.*, 1922, **23**, 144–175.

The data which form the basis for the present article are the results of 6 tests given to 127 school children around twelve years of age. The following are the tests: (1) Claparède's permutation test; (2) Claparède's test of memorizing 15 words; (3) absurd statements, after Binet; (4) Whipple's word-building test; (5) analogies, after Woodworth and Wells; (6) the Rybakoff test of noticing simple changes. The scores of each test are correlated with those of every other and the results show that the tests represent "different modalities of cerebral functioning" and that they are therefore not interchangeable. M. B. PRATT (Harvard).

513. THORNDIKE, E. L., and BREGMAN, E. O., On the Form of Distribution of Intellect in the Ninth Grade. *J. Educ. Res.*, 1924, **10**, 271–278.

By grouping the results of over 14,000 cases examined by nine different intelligence tests, which have been reported in the literature,

the authors find that the distribution of intellect of ninth grade pupils fits reasonably closely the theoretical curve of the normal law of error. S. W. FERNBERGER (Pennsylvania).

514. McGRAW, H. W., The Use of Test Data as a Basis for Drill in Grammer. *J. Educ. Res.*, 1924, **10**, 291–296. S. W. FERNBERGER (Pennsylvania).

575. ROGERS, B. M., Method and Measurement in Spelling. *J. Educ. Res.*, 1924, **10**, 302–307. S. W. FERNBERGER (Pennsylvania).

516. ULLMAN, B. L., and KIRBY, T. J., A Latin Comprehension Test. *J. Educ. Res.*, 1924, **10**, 308–317.

Description of the results of a new test. S. W. FERNBERGER (Pennsylvania).

517. WELLS, G. R., The Application of the Binet-Simon Tests to Groups of White and Colored School Children. *Psychol. Mono.*, 1923, **32**, No. 3, 52–58.

The Huey edition of Goddard's 1911 Binet-Simon scale was applied to 96 negro and 267 white children in the Oberlin city schools, of mental ages six to twelve. Although environmental variations between the races are considered less significant in Oberlin than in most parts of the country, the somewhat better showing of the whites in the tests is attributed by the author to racial differences in social conditions and limitations. L. A. PECHSTEIN (University of Cincinnati).

518. BROWN, W. M., Character Traits as Factors in Intelligence Test Performance. *Arch. of Psychol.*, 1924, **65**, 66.

A study of various kinds of scores given in the Thorndike intelligence examination led to the conclusion that much more significance is to be attached to the wrong answers made by an individual taking the examination than would appear at first sight. Heretofore the plus scores have been most emphasized in all examinations of this character. An attempt is made in the present study to substantiate the hypothesis and discover at least some of the ways in which wrong answers on intelligence tests may be evaluated. Wrong answers made on the intelligence examination were taken as indicative of

the presence or absence of the caution factor. Three groups were selected for study: Group I consisted of 375 students in Columbia College admitted in 1919 (males); Group II was composed of 193 children (147 boys, 46 girls) in a Hebrew Orphan Asylum, and Group III consisted of 166 men who passed through the U. S. Army General Hospital No. 30 in 1918 and 1919. The caution factor seems to have some influence on scholastic performance, though this fact is more marked in the case of the college men than in the case of the children from the orphanage. There seems to be a fairly well defined relationship existing between an individual's score on an intelligence examination and the caution factor, largely because this relationship is made to exist by the technic of scoring employed in dealing with the wrong answers, which form the basis for computing the caution index. In general, the results of the study tend to show that the cautious type of person, other things being equal, is more likely to excel in scholastic performance than the one of the opposite type. E. MULHALL ACHILLES (Columbia).

519. BROWN, W. M., A Study of the "Caution" Factor and Its Importance in Intelligence Test Performance. *Amer. J. of Psychol.*, 1924, **35**, 368–386.

The records in intelligence tests of a group of college students, a group of school children and a group of patients in a neuropsychiatric hospital were examined to determine evidences of cautiousness or rashness. The degree of caution was measured in terms of the number of items in the test which were attempted but were answered incorrectly. Correlations with scholastic performance in the case of the first two groups showed a definite relationship performance in studies and the factor of caution. There was also a correlation between the caution factor and score in the intelligence test used, but this seemed to be in large part due to the methods used in scoring the test inasmuch as they took account of cautiousness in penalizing for wrong answers. Partial correlations showed that the caution factor had little influence upon the correlation between intelligence and scholastic performance. In general, however, the cautious person is more likely to excel in scholastic performance than is the opposite type, other things being equal. G. J. RICH (Chicago, Ill.).

12. MENTAL EVOLUTION

520. Cholodnyi, N., Ueber den Einfluss der Metallionen auf den Geotropismus der Wurzeln. *Beihefte z. bot. Centralbl.*, 1923, **39**, 239–256.

Im Anschluss an die Versuche von Loeb, die zeigen, dass monovalente Metallionen das tierische Gewebe erregend, bivalente aber hemmend beeinflussen, hat Verf. seine Untersuchungen an Keimwurzeln angestellt, die erst in gewisse Salzlösungen getaucht und dann horizontal gelegt wurden. Es zeigte sich, dass Salze monovalenter Metalle die geotropische Krümmung mehr oder weniger hemmen oder sogar für beträchtliche Zeit die Krümmungsfähigkeit ganz lähmen, während die Salze bivalenter Metalle einen solchen Einfluss nicht ausüben. Er erklärt es damit, dass die monovalenten Metalle eine ungleichmässige Verteilung der Wachstumsenergie, wie sie zur geotropischen Krümmung notwendig ist, erschweeren, ja sogar ganz unmöglich machen, und zwar auch wenn eine genügende Wachstumsenergie vorhanden ist, dass aber bivalente Metalle dies nicht tun, sondern die ungleiche Verteilung sogar bei verminderter Wachstunsenergie erhalten. Versuche mit Salzmischungen ergaben, dass die Ionen von bivalenten Metallen die den Geotropismus hemmende Wirkung der monovalenten mehr oder weniger abschwächen. Möbius (Frankfurt a/M.).

521. Funk, G., Ueber Bewegungen der Kolonien von Oscillatoria amphibia Ag. Beiträge zu einer soziologischen Bewegungsphysiologie pflanzlicher Mikroorganismen. *Beihefte z. bot. Centralbl.*, 1923, **39**, 257–320.

Was Verf. hier als sociologische Bewegung bezeichnet, wurde früher Adelphotaxis oder symbiotropische Bewegung genannt und dürfte unter den Begriff der Cytotaxis fallen. Die mit aller Vorsicht angestellten und ausführlich beschriebenen Versuche ergeben folgendes: Die Bewegungen sind von mehreren Reizen abhängig. Je höher die Lichtintensität und je niedriger die Temperatur, um so dichter wird die Aggregationskolonie. Daher konntenbei jeder Temperaturerhöhung Kontraktionen solcher Kolonien festgestellt werden, ebenso bei Abkühlung und bei Unterbrechung des elektrischen Stromes. Dagegen fanden Ausdehnungen statt bei Verminderung der Lichtintensität, Erwärmung und Einschalten des elektrischen Stroms. Aus den Kontraktionen bei Erhöhung der Lichtstärke auch unterhalb der schädlichen Lichtintensität lässt sich schliessen, dass

jede Lichtverstärkung mit Umkehrbewegung der Oscillarienfäden beantwortet wird, und aus der raschen Reaktion auf Temperaturwechsel lässt sich auf eine stark ausgeprägte Thermotaxis der Oscillarien schliessen. Bei gleichzeitiger Einwirkung von Stromschluss und Lichtverstärkung überwog zunächst die Reaktion auf den Strom (durch Aussehnung), bis nach 3 Minuten die Lichtreaktion die Oberhand gewann, und energische Verkürzung eintrat: das bedeutet ein Ueberwiegen der photischen über die elektrische Reaktion. MÖBIUS (Frankfurt a/M.).

522. METZNER, P., Ueber induzierten Phototropismus. *Ber. d. Deutsch. bot. Ges.*, 1923, **41**, 268–274.

Fluorescierende Farbstoffe, in Spuren in die Zellen lichtempfindlicher Mikroorganismen aufgenommen, bewirken bei Gegenwart von 0 im Lichte Oxydationen, die je nach ihrer Intensität verschiedene Folgen haben können, und zwar bei hoher Schädliche, bei niedererer bewirken sie negative, bei ganz schwacher positive Phototaxie. In ähnlicher Weise lässt sich Phototropismus inducieren. Raphanus- oder Avena-Keimlinge, mit Erythrosin 1:500,000 behandelt, zeigen positiven Phototropismus der sonst indifferenten Wurzeln. Aber bei 1:50,000 nehmen sie soviel Farbstoff in die Epidermis auf, dass sie bei Belichtung geschädigt und zu einer positiven Krümmung veranlasst werden, die nicht auf Phototropismus beruht. MÖBIUS (Frankfurt a/M.).

523. STARK, P., Geotropische Reizleitung bei Unterbrechung des organischen Zusammenhangs. *Ber. D. deutch. bot. Ges.*, 1924, **42**, 125–130.

Verf. untersuchte Graskeimlinge auf ihre geotropische Reizbarkeit und zwar (1) mit normaler, (2) mit dekapitierter, (3) mit dekapitierter Wurzel, der sie Spitze wieder aufgesetzt war. Die der zweiten Serie reagieren schwach und spät, die der dritten halten sich in der Mitte zwischen eins und zwei. Die geschilderten Versuche führen also zu denselben Resultaten wie die auf Photo-, Traumato- und Haptotropismus bezüglichen. Zur Erklärung nimmt Verf. an, dass der Reiz an gewisse Stoffe gebunden ist, die von der Spitze auf die unteren Regionen übertragen werden. MÖBIUS (Frankfurt a/M.).

524. Nienburg, W., Die Wirkung des Lichtes auf die Keimung der Equisetumspore. *Ber. d. deutsch. bot. Ges.*, 1924, **42**, 95–99.

Wenn Sporen von *Equisetum* (*E. limosum, arvense, silvaticum*) einseitig beleuchtet werden, so besteht die erste Wirkung des Lichtes in einer Beeinflussung der Chromatophoren, die sich an der Lichtseite sammeln. Dann wird der an die andere Seite gedrängte Kern auch polarisiert, und zwar stellt sich bei der Karyokinese seine Spindel so ein, dass bei teilweise von unten beleuchteten Sporen die erste Wand parallel der Lichtrichtung angelegt wird, die Rhizoidzelle also auf der dunkeln Seite entsteht, während bei gleichmässig von einer Seite beleuchteten Sporen die erste Wand immer senkrecht zur Lichtrichtung steht und die Rhizoidzelle naturlich auch auf der dunkeln Seite gebildet wird. "Auch für Equisetum ergab sich also, dass nicht die Lichtrichtung, sondern der Intensitätsunterschied des Lichtes die polarisierende Wirkung ausübt." Möbius (Frankfurt a/M.).

525. Seidel, K., Versuche über die Reizleitung bei Mimosa. *Beitr. z. allg. Bot. v. Haberlandt*, 1923, **2**, 557–575.

Seidel hat sowohl die Versuche Riccas wiederholt als auch neue angestellt und gefunden, dass zwar an den Beobachtungen Riccas nicht zu zweifeln ist, dass aber die Deutungen auch anders sein können. So besteht offenbar neben der von Haberlandt angegebenen Reizleitung durch Druckschwankungen in den Schlauchzellen, also einer mechanischen, noch eine andere Art von Reizleitung durch chemische Stoffe, also eine physiologische. Vermutlich wird auch durch die Protoplasmaverbindungen von Zelle zu Zelle der Reiz geleitet. Daraus, dass diese Reizleitungen zusammen, aber verschieden schnell funktionieren, könnten manche Erschienungen erklärt werden. Einwandsfrei und umfassend ist das Problem der Reizleitung bei *Mimosa* noch nicht gelöst. Möbius (Frankfurt a/M.).

526. Brauner, L., Phototropismus und Lichtturgorreaktion. *Ber. d. Deutsch. Bot. Ges.*, 1924, **42**, 59–65.

Zur Prüfung der Richtigkeit der Blaauwschen Theorie hat Verf. die Variationsbewegung untersucht. Er benutzte das Endblatt von Phaseolus multiflorus und brachte am Gelenk unter der Blattspreite einen kleinen Spiegel an, auf den ein Fadenkreuz projiciert wurde.

Dessen Verschiebung auf einer Skala ergab die Bewegung, doch kann die sehr verwickelte Methode hier nicht beschrieben werden. Bei dem Versuch hat einseitige Belichtung durch Turgorsenkung der Lichtflanke positive Krümmung, und symmetrische Belichtung dass auch diese Versuche, wenn auch die Uebereinstimmung nicht genau ist, für die Blaauwsche Theorie sprechen. MÖBIUS (Frankfurt a/M.).

527. SCHUMACHER, M., Dekapitation und geotropische Krümmungsfähigkeit von Sprossen. *Pringsh. Jahrb. f. wiss. Bot.*, 1923, **62**, 420–448.

Es sollte der Einfluss der Dekapitation auf das geotropische Verhalten der Sprosse näher untersucht werden. Es zeigte sich, dass das Verbleiben oder Fehlen embryonalen Gewebes oberhalb der reagierenden Zonen von Bedeutung für die Krümmungsfähigkeit der Sprosse ist, wie besonders Myriophyllum proserpinacoides und Hippuris zeigen. Die Verhältnisse sind also hier ähnlich denen, die Miehe bei Tradescantia gefunden hat. Doch sind die Tradescantia-sprosse nicht orthotrop sondern plagiotrop. Eine Reizleitung von einem oberen Stengelglied zum nächstunteren findet nicht statt, jedes percipiert selbständig und reagiert seiner eigenen Lage gemäss. Innerhalb des einzelnen Stengelgliedes aber lässt sich eine percipierende und reagierende Zone unterscheiden. Die Lage des oberen Knotenteils ist für die Krümmungsrichtung maassgebend, die Krümmung aber wird nur vom unteren Knotenteil, der allein wachstumsfähig ist, ausgeführt, wenigstens in älteren Knoten. Wachstumsmessungen an Stengelgliedern bezw. Knoten, denen der nächstobere Knoten geraubt war, zeigten fast gar kein Wachstum mehr: es wird also durch die Dekapitation die motorische Phase des geotropischen Vorgangs gestört. MÖBIUS (Frankfurt a/M.).

528. SCHMID, G., Das Reizverhalten künstlicher Teilstücke, die Kontraktilität und das osmotische Verhalten der Oscillatoria Jenensis. *Pringsh. Jahrb. f. wiss. Bot.*, 1923, **62**, 328–417.

Die Apicalzellen können nicht die alleinigen Bewegungsorgane sein, sie sind sogar nebst den benachbarten Zellen wahrscheinlich tot. Jede Zelle des Fadens vielmehr ist fähig, photische und chemische Reize zu percipieren und weiterzugeben. Doch kann der Reiz nur dann Umkehrreaktionen bewirken, wenn er das während der Bewegung jeweils vordere Ende des Fadens trifft. Der Oscillarienfaden ist in hohem Maasse, und zwar besonders in der Längsrichtung

kontraktil, es lassen sich Längsverkürzungen des Fadens erzielen entsprechend einer Turgordehnung über 60 per centum. Mit diesem Verhalten haben die Oscillarien wahrscheinlich eine einzigartige Stellung. Dagegen ist der osmotische Wert der Oscillarienzelle ungewöhnlich niedrig: im turgescenten Zustand weniger als 0,65 Atmosphäre. Infolgedessen genügen winzige Druck- und Zugkräfte, um ihre Spannung zu verändern. Daraus lassen sich vielleicht Schlüsse auf den Bewegungsmechanismus der Oscillarienfäden ziehen. Möbius (Frankfurt a/M.).

529. Linsbauer, K., Ueber die Interferenz von Stossreizen und über Ermüdungserscheinungen an Blattgelenken con Mimosa pudica. *Pringsh.-Jahrb. f. wiss. Bot.*, 1923, **62**, 283–327.

Andauernde Erschütterung oder intermittierende Strossreizung eines Mimosenblattes bedingt zunächst keine Unempfindlichkeit oder Starre des in die Ausgangslage zurückgekehrten Blattes, sondern bei fortgesetzter Reizung pflegen wieder einzelne oder sereinweise Reaktionen aufzutreten. Aber bei den folgenden Reaktionen sind die erreichten Amplituden stets kleiner als bei der erstmaligen Reaktion. Mit der intermittierenden Reizung ist eine Erhöhung der Reizschwelle verknüpft. An sich unwirksame Reize äussern sich doch in einer Herabsetzung der Biegungsfestigkeit. Bei entsprechend lange durchgeführter intermittierender Reizung unterbleiben schliesslich die Reaktionen infolge einer Ermüdung vollständig. Bei Abbruch der intermittierenden Reizung kann das in der Ausgangslage befindliche Blatt völlig unempfindlich sein (Pfeffer) oder es kann die Empfindlichkeit erhalten sein (Göppert). Die Reaktivierung der Lage erfolgt nach jeder Senkung des Blattes mit ziemlich gleicher Geschwindigkeit, ohne Anzeichen von Ermüdung. Das an sich isobolisch reagierende primäre Gelenkpolster scheint wie die Nerven nach Ermüdung heterobolisch zu reagieren. Die Blättchen der Mimosa kehren bei dauernder intermittierender Reizung nicht in die Ausgangslage zurück, hier scheint also tetanische Reizung möglich zu sein. Möbius (Frankfurt a/M.).

530. Guttenberg, H. v., Ueber das Verhalten von Hypocotylen bei schräger Beleuchtung. *Beitr. z. allg. Bot. v. Haberlandt*, 1923, **2**, 547–556.

Die Versuche mit Haferkeimlingen hatten ergeben, dass es beim Phototropismus nur davon abhängt, welche Lichtmenge von der

beleuchteten Seite her ins Innere des Organs eindringt. Als neues Versuchsobjekt wählte Verf. das Hypokotyl von *Brassica Napus*, und die Versuche bestätigten das mit *Avena* gewonnene Ergebniss. Er giebt aber zu, dass sich die phototropischen Bewegungen nicht allgemein nach der Lichtabfalltheorie und dem Sinusgesetz erklären lassen. Möbius (Frankfurt a/M.).

531. Goos, H., Ueber das anatomische und physiologische Verhalten eines einzelnen Laubblattes nach Ausschaltung der übrigen Assimilationsorgane. *Beitr. z. allg. Bot. v. Haberlandt,* 1923, **2**, 500–546.

Wird einem einzelnen Laubblatt durch Entfernung oder Verdunkelung der übrigen Laubblätter eine wesentlich gesteigerte Ernährungstätigkeit auferlegt, so wird das Blatt dadurch meistens zu einer Verstärkung des Palisadengewebes gereizt, die auf einer Vergrösserung oder Vermehrung der Zellen beruhen kann. Bei Vergrösserung der Zellen wurden auch die Kerne entsprechend vergrössert, die Chloroplasten wurden vermehrt, nicht vergrössert. Stärke wurde später gebildet und rascher abgebaut als in normalen Verhalten, die Trockensubstanz erfuhr eine Zunahme. Die Transpiration was gesteigert, auf die Flächeneinheit bezogen. Die Elemente der Gefässbündel wurden vermehrt, auch die festigenden Gewebe im Blattstiel verstärkt. Möbius (Frankfurt a/M.).

532. Metzner, P., Studien über die Bewegungsmechanik der Spermatozoidien. *Beitr. z. allg. Bot. v. Haberlandt,* 1923, **2**, 435–499.

Die Untersuchung der Reizbewegungen ergab folgendes: Die Spermatozoidien sind tigmo- und chemotaktisch, nicht aber thermo-, elektro-, photo- oder geotaktisch reizbar. Die chemotaktische Anlockung ist eine echte Topotaxis: es reagieren nur die gereizten Flanken, die gleichzeitig vorhandenen "Schreckreaktionen" kommen auf ähnliche Weise zustande, sind "pseudophobotaktisch." Perceptionsorgane sind die Geisseln selbst. Reizerfolg ist Beschleunigung oder Hemmung der Wimpertätigkeit. Zwischen Reiz und Reaktion verstreicht eine Reaktionszeit von etwa 0,1 Sekunde. Beschleunigung der gereizten Wimpern führt zu topotaktischer Einstellung, Hemmung zu "pseudophobotaktischen" Reaktionen. Die Geschwindigkeit der Reizleitung beträgt etwa 64–80 μ in der Sekunde. Als reizleitende Struktur ist der Blepharoblast anzusehen. Möbius (Frankfurt a/M.).

533. Moss, F. A., Study of Animal Drives. *J. of Exper. Psychol.*, 1924, 7, 165–185.

The present experiment was devised to investigate the thesis that the behavior of any animal is the resultant of his drives to action and the opposing resistances. The animals used were white rats ranging in ages from 125 to 200 days. The preliminary training consisted in bringing the animals in contact with electric shocks from brass plates on the floor of one section of an experiment-box. These plates served subsequently as the repelling stimuli to the drives under investigation. The strength of sex, food, and maternal drives was studied by making it necessary for the rats to cross the brass plates before the desired stimuli could be reached. Observation of the behavior of the rats under these conditions showed, among other things, that in general a resistance may be overcome by increasing the strength of the drive, that a 72-hour hunger drive will overcome a 28-volt resistance; that the sex drive is weaker than the hunger drive and stronger than the maternal drive; and that a drive that is weaker than the resistance may be strengthened by other drives until it overcomes the resistance. From these observations the writer proposes the following general theses for the interpretation of animal or human behavior. (1) Any animal drive may be measured in terms of the resistance overcome, provided the strength of the resistance is known. Or, where the strength of the drive is known and that of the resistance is not, the resistance may be measured in terms of the drives. (2) Any drive that succeeds is stronger than the resistance overcome, and any drive that fails is not as strong as the resistance. (3) If two independent drives are opposed by the same resistance and one drive overcomes the resistance while the other fails, the one that overcomes the resistance is the stronger drive. (4) Given two drives, both functioning at the same time, and so arranged that neither can succeed without neglecting the other, the one that succeeds is the stronger drive. (5) Given two antagonistic resistances both functioning at the same time and both so arranged that neither can cease to function without overcoming the other, the one that overcomes is the stronger resistance. (6) When one drive by itself is not strong enough to overcome a resistance, it may be reinforced by other drives, until it is strong enough to overcome the resistance. (7) As a motive in provoking the learning of such problems as the maze, that drive is strongest which causes the animal to learn the problem in the shortest time and with the fewest errors. (8) Other things being equal, every

time a resistance is overcome, the strength of that resistance is weakened. (9) The combined results of these experiments seem to substantiate the basic thesis that the behavior of any animal is *the resultant of his drives to action and the opposing resistances.* C. C. PRATT (Harvard).

534. BIATZ, W. E., and HERON, W. T., The Effect of Endocrine Feeding upon the Learning of White Rats. *J. of Exper. Psychol.*, 1924, 7, 291–311.

In an attempt to throw some light on the general problem of the relationship between the ductless glands and personality, disease, intelligence, *etc.*, the present experiment was undertaken for the specific purpose of discovering how a disturbance of the "endocrine balance" of the body would affect the learning process in rats. This disturbance was brought about by feeding pituitary extract to one group of rats, adrenal cortex to another, and dried brain tissue to a third, control group. The experiment was divided into three parts. In the first part the learning process was studied by means of a square maze; in the second part an inclined plane problem-box was substituted for the maze; and in the third part the cumulative hereditary effect of the feeding was studied by using rats which were progeny of the original groups.

The results show that throughout the whole experiment the pituitary rats constitute the superior group and the adrenal rats the inferior group, while the control rats occupy a middle position. There can be no doubt that the feeding had an active influence on the reproductive (pituitary) and digestive (adrenal) systems, although it is difficult to isolate the factors and explain the results. C. C. PRATT (Harvard).

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PROCEEDINGS OF THE FOURTH ANNUAL MEETING OF THE WESTERN PSYCHOLOGICAL ASSOCIATION, STANFORD UNIVERSITY, CALIFORNIA, AUGUST 8 AND 9, 1924.

W. R. MILES, STANFORD UNIVERSITY, CALIFORNIA, SECRETARY.

The fourth annual conference met this year independently of other scientific associations. All officers were present, but it happens in this association that office holdings and business meetings are very secondary concerns in comparison with the four sessions arranged for the presentation of scientific reports. Our program was unique in at least one respect, that each of the 20 or more persons who were down for papers, appeared and read on the subject announced.

The registered attendance was 60 and there were several who did not bother with the formality of registering. The majority of the group were professionally interested in Psychology. Sessions were open to the University public and were well attended by students and other visitors. Some 15 colleges and universities were represented by one or more faculty members of their psychology departments. The meeting profited especially by the attendance of several visiting psychologists from the Central and Eastern states.

Professor Calvin P. Stone served as local committeeman on arrangements for entertainment. The lodging quarters were provided in a new dormitory, Branner Hall, which was turned over to the psychologists for their exclusive use. Following the afternoon session on August 8, tea was served at the Stanford Psychological Laboratory and visitors were welcomed to inspect everything from the Thomas Welton Stanford Collection of psychic literature and

materials to the colony of monkeys. A routing sheet was provided to assist in finding the various demonstrations. In the evening there was an informal dinner at the Stanford Union. There were 67 tickets sold for the dinner, but a somewhat larger group listened to the address which followed it, delivered by the President of the Association, Professor Edmund S. Conklin, on "The Classification of Personalities." Subsequent to this address various items of news and comments on happenings in the psychological world were volunteered by different individuals present. A message of greeting was sent to the psychologists meeting as Section J (Psychology) of the British Association for the Advancement of Science which was meeting at Toronto August 13–16, and reciprocal greetings were received from them.

The officers elected for the year 1924–25 are the following: President, Dr. Arthur H. Sutherland, 977 West 42nd Street, Los Angeles; Vice-President, Professor Raymond H. Franzen, University of California, Berkeley; Secretary-Treasurer, Professor W. R. Miles, Stanford University. The 1925 meeting will be held at University of California, Berkeley, July 24–25. The secretary invites correspondence with psychologists who may plan to attend that gathering.

ABSTRACTS OF PAPERS

The Geography of Intelligence. Raymond H. Franzen, University of California, Berkeley.

Various age and grade groups in a western city were measured with various tests and differences between schools in average and spread were tabulated. Correlation of disparity of schools in group-trait discriminations reveal a consistent character which is correlated with real estate values and income of parents. For instance, the position of schools relative to others by measurement of twelve-year-olds in Wylie Opposites may be predicted by their position by measurement of kindergarten children in the Park-Franzen.

Character and Personality Traits of Gifted Children. Lewis M. Terman, Stanford University.

Somewhat more than 600 representative gifted children of I.Q. 140 and above, were compared with about the same number of unselected children in (1) scores on a battery of character tests; (2) scores in the Wyman test of social, intellectual and activity interests; (3) rat-

ings by parents and teachers on 25 traits; (4) interest in and knowledge of plays, games and amusements.

(1) The character tests, selected from tests arranged and validated by Voelker, Cady, and Rauberheimer, included two overstatement tests, a test of honesty in the face of temptation to cheat, tests of interest in questionable books and questionable companions, a test of social attitudes, and the Woodworth-Cady questionnaire—test of emotional stability. In all of these tests the gifted group, age for age, greatly excelled the control group.

(2) The Wyman interest test is based on free association method. It has a very high reliability coefficient and correlates as well with the best obtainable criteria as did the intelligence tests of a few years ago. In activity interest the gifted and control groups are about equal, but the gifted are greatly superior to the control in the strength of both their intellectual and their social interests.

(3) The mean play information quotient of the gifted is 136. On the basis of the play preferences of unselected boys and girls, masculinity indices were worked out for ninety plays and games. These indices made it possible to derive masculinity ratings of the gifted children, based upon the masculinity of the games which they like and practice. The mean masculinity rating of the gifted boys was above the norm.

(4) The trait ratings showed good agreement between parents and teachers with respect to the traits in which gifted most excel unselected children. The order, from greatest to least superiority, is intellectual traits, volitional traits, moral traits, social traits, and mechanical ability.

The conclusion seems to be justified that in so far as gifted children deviate from unselected children in character and personality traits, the deviation tends to be in the direction of the ideal. However, the amount of deviation differs greatly for different traits.

The Intellectual Factor in Children's Drawings. FLORENCE L. GOODENOUGH, Stanford University.

The experiment described was undertaken with the object of determining the extent to which the nature of the drawings made by children in their early years is conditioned by intellectual development. Previous investigations have suggested that these drawings may afford a valuable index to the nature and organization of the child's mental processes, and may thus throw light on some of the characteristics of mental growth. It was therefore believed that a

special study of the intellectual factors shown in children's drawings might prove to be especially useful in the analysis of mental function, and in the study of race, sex, and individual differences. In order to carry out an investigation of this kind, it was necessary, first, to construct a scale for measuring intelligence as shown in drawing. For this purpose drawings of the human figure have been found to be most suitable. By means of objective analysis and comparison of the drawings of several thousand children of different ages and varying educational achievement, a method of scoring has been derived which has proved serviceable as a measure of general intellectual maturity. The nonverbal nature of the test makes it especially suitable for studying the mentality of children from foreign homes and of deaf children.

The scale has an average reliability of .77 for ages five to ten years considered separately. The standard error of estimate of a true score ranges from 5.3 months of mental age for five-year-old girls to 8.5 months of mental age for nine-year-old girls. The standard error of estimate of an I.Q. based on the drawing scale is approximately 8 points at all ages from five to ten years. The correlation between Stanford-Binet I.Q. and drawing I.Q. was found to be .741 for a group of 334 cases for which the standard deviation of the Binet I.Q. distribution was 19.1.

The Validity of Self-Estimate. EUGENE SHEN, Stanford University.

Taking the average rating of an individual by a group of six or seven judges (self included) as a criterion and comparing it with his self-estimate, three measures of errors of self-estimate were derived: a total error, a systematic error, and a chance error. For twenty-six individuals on eight traits, the average total error of self-estimate (.72) was larger than the average standard error of rating associates (.59). The systematic errors according to traits were mostly positive, but rather small on the average ($\pm$.25), so that after due regression the average chance error (.65) remained larger than the average standard error of rating associates. But when the systematic errors were calculated according to individuals, their average became much more significant ($\pm$.41), and after regression the average chance error (.40) was considerably smaller than the average total error. The tendency of over- or under-estimation of the self is thus a function more of the individual than of the trait, and taking this into consideration the relative inaccuracy of self-estimate is only illusive.

The Determiners of Animal Learning. EDWARD C. TOLMAN, University of California, Berkeley.

The purpose of the present paper is to indicate what seems to the writer, at the present stage of things, a fruitful conceptual system for thinking about and explaining the experimental facts of animal learning. This system would not limit itself to, nor focus directly upon, the usual physiological concepts of stimulus, neural excitement, synaptic resistance and resultant muscle contraction. It would, rather, talk at first hand about the activities of *purpose* and *cognition* as these reveal themselves directly and immediately in behavior and in learning. In so doing, it would not deny the eventual possibility and desirability of translating its own concepts of purpose and cognition into the more ultimate terms of physiology. It would merely claim that, at present, such a translation is very largely impossible, and the attempt to make it, misleading and unfruitful.

To be more specific, the present paper asks you to envisage the facts of animal learning (and indeed of human learning as well) in terms of: (1) a goal-seeking; (2) a set of innate or acquired exploratory tendencies which this goal-seeking releases; and (3) a set of cognitions as to *how to reach* the goal, cognitions which are progressively acquired because of and during the activity of the exploratory tendencies. Experiments on animal learning would then be classified, or new experiments suggested, because of their bearing upon the nature of, or the conditions determining, one or the other of these factors. Or, to put it in other words, all experimental work on learning will be found to seek an answer for one or the other of the three questions: (1) What are the defining elements of the goal-seeing which gives rise to a given learning? (2) What are the defining characters, and what the extent, of the exploratory tendencies, and what their functional dependence, if any, upon the different types of goal sought? And, finally, (3) What are the defining natures of, and the causal factors determining, the resulting cognitions of "how to get there"?

The body of this paper will recall to you actual experiments, accounts of which are already in the literature; will briefly describe other experiments performed in the California laboratory, but as yet unpublished; and, finally, will suggest new experiments which ought to be performed; all tending to throw further light upon and to emphasize these three questions, as the latter may be raised for the specific case of maze-learning and of rats.

The Problem of Psychoneural Set. PAUL T. YOUNG, University of Illinois, Urbana.

Animals frequently assume and maintain bodily attitudes which anticipate overt behavior. These postures involves a temporary setting of the neuromuscular mechanism. A similar setting probably takes place whenever an individual receives an instruction but in this case the setting may not be outwardly observable. The meaning of a set may be expressed in words even though the nature of the neural mechanism be unknown. Psychoneural sets condition human experience as well as behavior and their study is therefore important for all types of psychology.

Psychological Systems in Their Relationship to Selling. EDWARD K. STRONG, JR., Stanford University.

A perusal of the literature on advertising and selling leads to the conclusion that there are three definitely formulated theories as to how to influence one to buy.

The first theory is expressed by the five words: "attention, interest, desire, action, satisfaction." There is implied here that the prospect must successively experience these five conscious states; and emphasis is put upon establishing them.

The second theory is expressed by the slogan, "appeals—response," and is a direct application of behavioristic psychology.

The third theory is expressed by the terms, "wants, solution, action, satisfaction."

In the second theory emphasis is put upon what the seller presents, upon the external factors in the total situation affecting the buyer; in the third theory, on the other hand, emphasis is put upon the internal factors—the wants, plans, aspirations of the prospective buyer. Selling in the latter case is a process of calling to the prospect's mind some one or more of his wants and showing how they may be satisfied by buying the seller's goods. The term "action" in the formula implies that the seller must more or less force the issue at the end; also that the prospect must not only buy but also use the commodity, and that the seller must make sure that he can and will use it correctly. Satisfaction is, finally, most important because, unless the goods measure up to expectations, there will be no repeat orders.

Description of Eidetic Phenomena. HEINRICH KLÜVER, Stanford University.

The nature of AB (Anschauungsbilder, percept-images) is illustrated by referring to certain parts of an experimental study with a group of "Eidetiker" consisting of students of Stanford University and State Teachers' College, San José, and of pupils of grade 6A in a Palo Alto grammar school.

Experiments with pictures of animals and with silhouettes are reported which are apt to throw light on the process of eidetic vision: the "building up" and "fading away" of the AB; succession of the different parts; factors determining the sequence of the different parts; localization and duration; degree of completeness and distinctness; relation of subjective factors ("will," "thinking") to objective factors (properties of the stimulus: form, color, etc.); stage intermediate between "visualization" and "imagination"; and the relation of AB to after-images and memory-images.

Some experiments concerning color-mixture in the AB are reported to show that we have to do with phenomena having a certain kind of perceptual givenness and a certain objectivity.

In the experiments concerning different problems of perceptual psychology, measurements of AB could not play the decisive rôle assigned to them by E. R. Jaensch since the cases found apparently have not the "psychonomic" character of the Marburg cases. Emphasis is laid upon the phenomenology of AB. Thus it becomes evident that some of Jaensch's methodological presuppositions are untenable. The lability of certain phenomena often reminds of Urbantschitsch's cases.

A Rotation Table for Laboratory Animals. FRANKLIN S. FEARING, Stanford University.

In connection with a study of vestibular and semi-circular function in pigeons, it was desirable to construct a rotation table in which the rate of acceleration and retardation of rotation would be constant. Such a table for the purposes of this study should be mechanically controlled as to starting and stopping, and if possible be free from electrical operation.

The apparatus designed is approximately five feet in height and the circular top is approximately two feet in diameter. A system of counter weights mechanically initiates and maintains the rotation. The rotation is begun by means of a weight which is attached to the

under surface of the table. This weight pulls the top through half a revolution and then is released. The table continues rotation at an approximate constant speed for ten revolutions. During the last half of the tenth revolution, a brake attached by a cord to the axis of the table is pulled into contact with the periphery of the table and thus stops the rotation. By this arrangement the acceleration and retardation of the table are fairly constant and the rate of rotation is maintained with little variation by means of a counter weight. The acceleration and retardation consume approximately half a turn each, thus leaving nine complete revolutions at a constant rate. The apparatus is so arranged that clock-wise and counter clock-wise rotation may be alternated, *i.e.*, it is possible to give ten revolutions in one direction followed by ten in the opposite direction. The table is timed to give ten revolutions in twenty seconds. The post-rotational phenomena in rabbits, cats, rats, and pigeons may be studied by means of this table.

Review of Alcohol Studies. W. R. Miles, Stanford University.

Five trained typists were studied with ethyl alcohol doses of 21 to 42 grams taken in 14 to 22 per cent solutions. Errors in typing all grades of copy were increased about 40 per cent in the first two hours after taking the smaller dose and 70 per cent in the similar period following the larger ingestion. Many of the errors were groups of awkward misstrokes which greatly increased the illegibility of the product. Speed of writing was decreased 3 per cent. Other motor coördinations were slowed to the extent of 4 to 9 per cent. The pulse during rest, work of typing, and rest just after typing periods, was faster by 5 to 7 per cent after the smaller dose and 8 to 9 per cent after the larger one as compared with results from nonalcoholic doses. The alcohol effect found in a duplicate or second series on one of the typists was in the same direction and larger than that shown in the first series.

In a group of six experiments on a medical student the subject was tested for ninety minutes in the evening and during a similar period the next morning. He slept throughout the night in a respiration chamber and the alcohol was introduced through a rectal catheter during the first hour or so of sleep. In comparison experiments saline solutions of the same volume were introduced. Numerous sets of electrocardiograms taken while the subject slept confirm the direction and extent of the effect on the heart rate as mentioned above. On mornings following alcohol (37.5 grams in 7.5 per cent solution, and here the subject could not know what had been given him) the

various neuromuscular measurements reflected a depressant action of 2 to 6 per cent.

On one subject several series were completed in which 27.5 grams of alcohol were diluted with water, beer, grape juice, and cider, respectively, to 2.75 per cent strength. The results were in the same direction and with successive series the effect did not decrease. When this dosage in grape juice was tried with a group of nine men, mostly medical students, it was definitely found that pulse rate was faster, skin temperature higher, reflex irritability decreased, muscular movements were slower, and various coördinations were considerably less accurate. Those tasks which made a continuous demand on the subject, such as standing quietly, or the pursuitmeter test, exhibited a stronger effect than did such a discontinuous test as reaction time. In connection with these different measures of performance before and after alcohol (and nonalcohol) doses the amount of alcohol appearing in the blood and urine taken at frequent intervals was determined. The depressant symptoms increased rapidly at the same time that the alcohol content in the body fluids was increasing, and the two maxima were about synchronous, at sixty-five to ninety minutes after drinking. Some of the toxic evidences soon disappeared after the maximal concentration in the blood had been passed. Of the men who took the 27.5 grams in 2.75 per cent solution the one who showed the most prominent effects gave also the highest values for alcohol in his blood and urine. The ranking was fairly parallel down to the man who demonstrated the least effect and had the lowest concentrations. The complete report has appeared as *Carnegie Institution of Washington, Publication No. 333,* 1924.

Nervous and Mental Characteristics of Mongolian Imbeciles. Kate Brousseau, Mills College, Oakland.

Based upon personal observations as well as upon case reports published in medical literature. More than one thousand cases have been studied.

Mentally we find that Mongol children show but few defects and perversions that distinguish them from other aments. In most cases there are no serious defects of the peripheral sense organs or of the sensory nerves. Sensibility to pain appears, in most cases, to be fairly normal. Sensibility to touch is somewhat diminished, due for the most part to a lack of attention. Mongols of the high imbecile class recognize the shape of familiar objects examined by the hand, showing that they are able to interpret impressions received from

cutaneous and kinesthetic senses. The sense of smell seems to be somewhat impaired, owing in part to a defective condition of the mucous membrane. The fissured tongue of the Mongol does not appear to cause any anomaly in the sense of taste. In all Mongols sex sensations are evidently very much diminished. Mongols do not show sex desires and there is no record of a Mongol becoming a parent.

Eye defects are often associated with Mongolism. In some cases the writer found disturbances in visual sensations due to imperfection in the visual sense organs. A few Mongols are congenitally blind but more often the apparent blindness is due to inattention rather than to a defect in the sense organ. Nearly all Mongols show an unusual fondness for music and rhythmical sounds, thus indicating that there is seldom any defect in hearing.

Motor Activity: Spontaneous movements appear much later in the Mongol than in the normal child. The Mongol infant is usually inert, listless, and there is a marked degree of muscular and tendon hypotonia. Holding the head erect, sitting, creeping, and walking are very much delayed in their development. The Mongol shows abnormal laxity of the joints, permitting a range of movement impossible in the normal child. The power of articulate speech is very much delayed and in many cases is never acquired.

Emotionally Mongols show no characteristic disturbances. They are usually good-natured, cheerful, and very affectionate.

The writer has gathered data concerning the mental ages and I.Q. of 206 Mongols. Grouping these children according to their I.Q., it was found that only two of these Mongols were morons, while 126 belonged to the imbecile group and 78 were classed as idiots. Deficient attention is a noticeable characteristic of the Mongol child. It is interesting to note, however, that certain stimuli attract and hold the attention; these are musical sounds. Mongols are markedly deficient in memory processes. A noticeable peculiarity of Mongol children is the tendency to imitate the actions of those about them.

This paper is a part of a monograph, about to be published, on the Physical and Mental Characteristics of Mongolian Imbeciles.

Freudian Theory and Sexual Enlightenment—A Study of Resistances. CAVENDISH MOXON, Los Altos, California.

There is evidence of unconscious resistances in the class of persons who accept some Freudian theories and yet show a disinclination

to approve the sexual enlightenment of the young and ignorant by psychoanalytic education or therapy.

In view of recent psychoanalytical research (especially that of Otto Rank on the Trauma of Birth) all men are alike in their tendency to repeat as far as possible the psychophysical state before birth. Men differ in their ability to transfer to new, real, and external objects some of their interest and love. Even the scientist may find it hard to divert his attention from the painful experience of separation and solitude consequent on birth. In the involutionary stage of life, the attempts to maintain the " reality principle " as the dominant motive may fail to restrain the regressive tendency and the pleasure in fantasy.

Education has been largely in the hands of elders and other persons who have renounced adult forms of sexual activity. In these persons can be studied some unconscious resistances to the sexual enlightenment of the ignorant. The elder is inclined to wish to delay the development of adult sexual behavior,

(a) By the mechanism of unconscious identification with idealized children who can be imagined to live in the Paradise which the elder has lost;

(b) By the mechanism of unconscious envy and jealousy of the young who may be regarded as potential sex rivals;

(c) And by the mechanism of projection on the young of the fears and hates felt in childhood of the elder for his own parents.

The myth of the Garden of Eden in the Book of Genesis symbolizes the enjoyment of the intrauterine situation and the traumatic consequences of its loss, which was the condition of adult activity.

Psychoanalytic experience shows that the need for sex knowledge is limited only by the capacity for understanding, which is indicated by the form of the questions put, if fear is absent; and that the repression of sexual curiosity has serious inhibitory effects on intellectual activity and educational capacity.

Intelligence Tests of the Los Angeles Police Force. GRACE M. FERNALD and ELLEN B. SULLIVAN, University of California, Southern Branch, Los Angeles.

This work was done at the request of August Vollmer, chief of police, and with the coöperation and assistance of his staff. Our preliminary report is based on the tests of 1,712 members of the Los Angeles police department, including all branches of police service.

Two forms of the Army Alpha test were given to each man. The Terman Group test and the National Intelligence test were then given to each man who made a score of less than 50 points on the Army Alpha tests. (It is further planned to give an individual Binet test to each member of the last mentioned group.)

1. The mean score for the total group on the first Alpha is 84 and on the second Alpha 102. The correlation (Pearson product-moment) of scores on the first and second Alpha is +.96. The mean difference is 17.8 points.

2. A comparison of groups shows the mean for patrolmen to be six points higher than that for sergeants. The range for patrolmen is 3 to 201, while that for sergeants is 11 to 158. The range for captains is 22 to 168. These results would seem to indicate that some factor is tending to eliminate the patrolmen of better mentality and that the conditions of promotion are not such as to eliminate those of a very low degree of intelligence.

3. The police group is only slightly higher than the unselected group of army privates. Compared with 1,760 entering students at the Southern Branch of the University of California, the following facts are of interest: 41 per cent of the total police force get below B, which is lower than all but 9 per cent of the university group. Of 1,760 students tested only three graded below 60, and each of these three was dropped before the first mid-term examination. Two hundred fifty of the 1,712 police, including all classes of officers, graded below 60. Of 272 ranking officers, including captains, detective lieutenants, and sergeants, 7 per cent received a grade of C— or less. The ten highest scores include 6 patrolmen, 1 statistician, 1 chauffeur, 1 stenographer, 1 motorcycle officer.

4. Seventy-six of those grading below 50 on the second Alpha test were given the National Intelligence test and the Terman Group test. Not one of these made any considerable improvement of score on these tests. On the National Intelligence test not one of this group scored above 121, which is below the thirteen-year norm; only eight scored as high as the twelve-year level; eight scored below the eight-year level.

5. Mr. Vollmer reports: (1) A considerable selection of men of high scores for positions of responsibility has been justified by their superior performance; (2) the plan for selecting new members of the Los Angeles police force has been made to include a mental test.

Applied Psychology in the Los Angeles Public Schools. A. H. SUTHERLAND, Los Angeles.

The psychologist in the public schools faces many problems in the reactions of normal children quite apart from those which have to do with supernormal and subnormal. And in respect to these normal children the first thought must be, What can be done to provide each child with his opportunity? But administrative rules and practices do not now contemplate that the child may be normal, yet be suffering sadly for lack of an opportunity to work at the kinds of problems in which he is weak and to further strengthen the abilities in which he is strong.

The department at Los Angeles has grown, perhaps beyond other departments in size and service, because of a recognition of the fact that splendid buildings and equipment, excellent teachers and supervisors are not the last word in education. The administrative problem of adaptation to the needs of the children is yet to be faced. As a means to this end, twenty-three specially trained teachers in the elementary school were constituted as counselors, going about from school to school to determine the educational preparation and advancement of pupils by means of standardized tests. In the high schools five teachers were similarly relieved from classroom duties for the purpose of giving tests. The central office has become a staff of one director, two supervisors, five assistant supervisors, seven teacher assistants, six clerks, and one statistician. Of this staff for psychological service two persons are detailed to the problem of the subnormal.

For the normal or dull normal child who falls low on the tests and is considered misfit, a specially organized set of lessons has been prepared, intended to give to both teacher and pupil samples of subject matter, approached from an angle, and requiring the exercise of certain methods of attack and the consequent mental organization. The use of this series of lessons has been so satisfactory that over 10,000 children per year are taught by teachers who have had the necessary training. The pupils are returned to grades, in general, victorious over their difficulties. A careful statement of the relative rapidity of progress may be made in terms of the average. The average pupil selected for this training work is carefully examined, placed, and taught how to work. He then proceeds individually as rapidly as he can. The length of his stay in the work averages twelve weeks, during which time he makes more than one year's progress, or at the rate of 3.36 to 1 (the standard being one grade per year). This

being an average figure, it is to be noted that approximately half the children made progress in the development of their abilities at a rate faster than three times the normal rate of development.

For the easier comprehension of those laymen who are accustomed to think in terms of dollars, this rate of development has been expressed in terms of the average per capita cost of the elementary pupil, which is $96.16, or $2.40 per week for forty weeks. The cost of progress per week for the average child, then, is $2.40 and for 3.36 weeks is $8.06. But the pupil under this special plan of work secures the same progress during one week for $2.40. The saving, therefore, is the difference, or $5.66 per pupil per week. The saving of time and energy of the entire number of pupils, 4,023 over an average of 12.69 weeks, amounts to the respectable sum of $288,931.86, figured on the basis of grade progress.

Since this amount of progress can be shown with misfit children, it is clear that sooner or later the child will have the attention which he requires. The psychologists can be of much service in showing these needs in greater and greater detail.

The Effects of Cerebral Destruction on the Sexual Behavior of Male Rabbits. Calvin P. Stone, Stanford University.

A majority of recent reports on sexual phenomena are primarily concerned with the endocrine functions of the gonads; temporarily, the consideration of other factors underlying sexual behavior has been neglected. The present study has for its specific purpose the task of determining what portions and what amounts of the cerebral cortex may be destroyed in male rabbits without causing impotency and sterility. Incidentally it sheds some light on the rôle played by the cerebral cortex in the awakening and maintenance of a fundamental congenital response.

With animals under deep anesthesia dorsal and dorsolateral portions of the cortex were destroyed by cautery. Tests for potency and ability to impregnate females were made both prior and subsequent thereto. On the basis of experimental data now at hand it may be said that in the dorsal or dorsolateral regions of the cerebral cortex no circumscribed area was found necessary for retention of the reproductive functions. Furthermore, the data would seem to justify the forecast that through successive operations on one animal all of the dorsal and the dorsolateral convexity of the cortex may be destroyed without incurring the loss of copulatory ability or the ability to beget young.

Psychological Research in State Institutions. FRED C. NELLES, Whittier State School, Whittier, Calif.

Psychological research has distinct values to the state in the prevention of delinquency and to the administrator of a state institution who is trying to deal with delinquent individuals. Speaking particularly of Whittier State School, psychological research furnished much valuable data on which to base plans for the successful establishment of a new policy introduced twelve years ago, to replace archaic and outworn methods and ideas. Inducement, expression, confidence, trust and respect, being substituted for compulsion, repression, distrust, and fear. The old congregate system, giving way to recognition of individual differences and home life in cottages. An attitude of rather sullen resentment on the part of the boy has disappeared. The percentage of success recorded after the boys leave Whittier has been steadily increasing.

In 1912, the beginning of this administration at Whittier State School, there were both boys and girls with an age range of from eight to over twenty-one years, and even married men and women. The level of intelligence varied from an I.Q. of .56 to 1.27, with histories from sheer dependency to and including murder. On psychological grounds the limitation of the school to fairly uniform types was accomplished along the following lines: (1) Sex: the establishment of a girls' department ninety miles removed. (2) Age: the law was amended so that only boys under sixteen years of age would be committed although the school retains jurisdiction over them until twenty-one years of age. (3) Mentality: whereas formerly 30 per cent of the school's population was found to be feebleminded, to-day a survey shows that but 5 per cent are feebleminded and over 75 per cent below normal or above. A provision was thus made for the transfer of feebleminded to institutions conducted for their care. (4) Admission: the law was amended so as to provide for acceptance of boys at Whittier on probation from the courts without commitment; and (5) Complete Examination: the psychological was supplemented by examinations of a psychiatric and neurological nature following a routine of the medical examination.

Psychological research begun at Whittier has extended to other state institutions, private institutions, and public schools. It has offered a basis of recommendation to parents and guardians of problem children. It has resulted in the founding and publication for seven years of the *Journal of Delinquency.* Special scales have been devised for measuring home and neighborhood conditions. Whittier

has become the western representative of the Eugenic Record Office of New York, supplying duplicate copies of all family histories.

The psychological work at Whittier has received the general support of the psychological profession in California. Whittier is particularly indebted to Grace M. Fernald, Lewis M. Terman, and J. Harold Williams. The latter was for some years the director of the Department of Research and editor of the *Journal of Delinquency*. The administrator who fosters psychological research has to stand alone and is subject to political attack. Even the fruitful scientific study of these problems in human behavior at Whittier State School has no guarantee of permanency, although there is hardly a greater problem than delinquency facing the people of this or any other state in the Union.

Educational Achievement of Children with Personality and Behavior Difficulties. PHYLLIS BLANCHARD, RALPH P. TRUITT, and RICHARD H. PAYNTER, JR., Child Guidance Clinic, Los Angeles.

This study is a preliminary report of a group of children from the second to ninth grades, inclusive, who have been studied by Child Guidance Clinic No. 1, conducted in Los Angeles by the National Committee for Mental Hygiene as a part of the Commonwealth Program for the Prevention of Delinquency. Only ninety-one of our cases to date fall within this group, the others being pre-school, kindergartners, or first graders, and hence below the range of educational tests, or else high school students above the test range. The I.Q. distribution of the group is from 82 to 153 by the Stanford-Binet, and the average I.Q. is 110.5. The average E.Q. is 106.2 and the average A.R. is 94.7. The fact that the children included in this study are of good intelligence affords a better opportunity to observe the effect of their personality and behavior traits upon their educational achievement, since there is no factor of mental deficiency to be evaluated and discounted.

The children have come to the clinic from various sources. Some have been sent from the Juvenile Court for serious offenses; many have been singled out by the teachers because of their failure to adjust to the discipline of the classroom or other behavior difficulties; many more are brought by anxious parents who have learned of the clinic through the newspapers or speeches at parents-teachers association meetings. All are given the same type of study, which includes the taking of a complete social history and thorough medical, psychological, educational, and psychiatric examinations. The purpose of

the clinical study and treatment is to recognize and correct personality and behavior deviations, and to prevent their development into mental disease or delinquency. After the examinations are completed, a staff conference is called on the case, at which the findings from the several examinations are reported and a plan of treatment mapped out. This treatment is thereafter carried on by the psychiatrist, psychologist, medical men, and social worker coöperatively.

Since this is only a preliminary report upon a small number of children, our findings are tentative. Undesirable personality traits and behavior difficulties are fairly evenly distributed through the different levels of intelligence and educational achievement. Only about one-eleventh of the children were free from physical conditions sufficiently serious to require medical or surgical treatment. Poor heredity was prominent in slightly more than one-third of the cases, and was fairly evenly distributed through the different levels of intelligence and educational achievement. Bad environmental influences, which appeared to have a direct bearing on the personality and behavior difficulties of the child, were found in *every* case.

Up to the present time our clinical studies indicate that severe personality and behavior difficulties may be found in children of high intelligence and educational achievement. The causation therefore must be sought in other than intellectual factors. When we have control groups through a study of a representative cross-section of unselected children, we shall know more as to the part that physical defects, poor heredity, and pathological social situations actually play in the development of undesirable personality traits and behavior patterns. This further knowledge may be only a point of departure for our search as to etiology, and we may need more refined methods of studying emotional responses, temperamental traits, and other nonintellectual processes before our problem is solved.

The Analytical vs. The General Diagnosis in Clinical Psychology. Lightner Witmer, University of Pennsylvania, Philadelphia.

A New Type of Functionalism. W. B. Pillsbury, University of Michigan, Ann Arbor.

This is a suggestion made in a belief that a definition or statement of the purpose of psychology should formulate as closely as possible the actual ends and attainments of the greater number of workers in the science rather than attempt a logically rigid *à priori* statement. Some of the present formulas seem rather to serve as a basis for

" holier than thou " cliques, with formulas that, like the creeds of certain religious sects, are sufficiently improbable to make a virtue of belief under difficulties. The greater the improbability, the greater the merit in belief.

I believe that all really admit the existence of mental functions that the man as a whole exhibits, whether there is agreement upon the way the function attains its end or not. There is no doubt that an individual is pleased whether he is conscious or not, or whether " affection " is or is not a mental structure. Similarly a man undoubtedly " means " a certain thing at a given time, it matters not whether that meaning is imaged or imageless, or whether the imagery, if it exists, is sensory or a motor twitch.

If we accept the function, as such, as the subject matter of psychology, we can first state the conditions under which the function is exercised—can study the limits of its efficiency—and then go as far as we can in a study of its mechanism. With the latter problem all of the controversies of the present different points of view will of course make their appearance, but we shall have a statement of what can be accepted before the points of divergence are emphasized. We can at least start before breaking up into hostile camps. As it is, a single fact may wreck all or most of the present formulations. If thought is imageless, the universal structuralism must be abandoned; if anywhere in the world an individual is conscious, behaviorism is gone. Animism is too far away from facts to be easily disturbed, but even it may some day hit a factual snag.

As opposed to the older functionalism of Dewey and Angell, I would omit all reference to anything that functions. The statement that the physiological processes take care of the individual until they no longer suffice and then mind begins to function to remove the obstacle, seems to me a needless separation between the provinces of physiology and psychology. We can study the function as a fact or accomplishment and leave all theory as to ultimates until facts are exhausted, and even then state the theory as a hypothesis or probable formulation of observed facts rather than as a major premise.

Heredity, Environment and Mental Achievement. TRUMAN L. KELLEY, Stanford University.

A REVIEW OF RACIAL PSYCHOLOGY

BY THOMAS R. GARTH

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The last review of racial psychology which appeared in the BULLETIN was made by Professor R. S. Woodworth in 1916, under the title, "The Comparative Psychology of Races." [1]

Eight years have elapsed since this excellent summary was published. The trends of racial psychology noted by the reviewer at that time have become more and more evident, although new trends have rapidly developed. The experimental and statistical attack of the problem of racial differences is the method by which racial psychology has gone rapidly forward; and this, indeed, is to be regarded as gratifying to the experimentalist. On the other hand, theoretical studies, and popular presentations of the problem, have valiantly assisted in the development, the former appearing in various books and professional magazines, the latter in the popular monthlies, and even in the science service sections of the newspapers. A survey of the literature of the latter type, which, as has been indicated, is more or less theoretical—that is to say, this literature is not always based on experimentation—brings to light just this tendency of relying more and more on the results of "mental anthropology." It seems appropriate, therefore, to examine this theoretical type of study first, and review the experimental studies later, because these theoretical studies as well as the experimentations all come within the span of the last eight years, from 1916 to 1924, to date.

In going over this indicated division of the literature, there is to be noted, then, a tendency for the sociological, anthropological, and psychological writers on the subject to begin to take into consideration the findings of the experimenters working with mental tests, when they are considering mental differences in races. But we shall now note the attitude of these writers toward the question of equality or inequality of races. In fact, as these studies are examined the thing most predominant is a characteristic state of mind, not a new one on the part of professional and lay thinkers, and that is a belief in racial

[1] WOODWORTH, R. S. The Comparative Psychology of Races. PSYCHOL. BULL., 1916, 13, 388–397.

differences in mental traits. The positive belief is pretty thoroughly held by almost all of these theoretical writers. According to them it is a serious mistake to think of all human minds as the same.

Levy-Bruhl (56, p. 7) insists that such a doctrine or belief in the identity of an " esprit humain "—" dans tous les temps et dans tous les lieux," which has amounted to a postulate or axiom with some investigators, as the school of Tylor and Frazer, is wrong and has been followed by serious consequences in the thinking of this school of savants. He goes on to say (56, p. 454) that the postulate is incompatible with the facts revealed by the comparative studies of diverse human societies. He further says that the mentality of inferior peoples is of a character essentially " prelogique et mystique," which is oriented otherwise than ours, and whose social concepts are controlled by the law of participation. Consequently (57, pp. 517–518), he warns against a strong tendency on our part to attribute to primitive peoples mental operations similar to our own. They may have survived in the struggle for existence by various means, it is true, and may have invented tools and obtained " dans la production d'un certain objet, des résultats d'une délicatesse et d'une exactitude suprenantes," and from such facts we are disposed to think of their resemblance to us in point of mental operation. But, according to him, very close observation and analysis alone reveal the differences. As one reads Levy-Bruhl one is not satisfied as to whether he has disposed of qualitative similarities absolutely. One remembers that Woodworth said in 1910 if there are differences in mental traits among races they must be differences in degree and not in quality, for memory will always be memory, perception always perception, in all races.[2]

Madison Grant, in *" Passing of The Great Race,"* holds a like view of the inequality of mind (39, p. 226). Of the Alpine, the Mediterranean, and the Nordic races, he says that they vary intellectually and morally just as they do physically; that moral, intellectual, and spiritual traits are as persistent as the other characters, the physical, and moreover that they are transmitted unchanged from generation to generation.

Again Lothrop Stoddard's purpose in *" The Rising Tide of Color "* (92) is to encourage the " comity " of white peoples, which he calls the " psychological basis of white civilization " (p. 198).

[2] The writer wishes to make acknowledgment of the assistance of his wife, Ethel Tucker Garth, in reviewing the work of the theoretical writers mentioned in this article.

Science, he claims, has served to " fortify white race consciousness with its sanctions." White leadership has brought civilization to the present advanced state, as for instance during the nineteenth century man entered a new material world which was an improvement in degree and kind above all that had been previously accomplished, and it was the " white man's brain " which had conceived all this. Unfortunately the reader is not shown why the superior white man labored under the primitive shadow of folkways, waiting until one hundred years ago to begin his dizzy intellectual climb. The reviewer believes that a careful study of the vicissitudes of education of the white race is apt to make one feel humiliation rather than pride in his kind. Moreover, Stoddard says (p. 165) that each race type, set up by " milleniums " of isolation and inbreeding, is a stubbornly persistent energy; each type possessed a special set of characters, not merely physical characters visible to the naked eye, but moral, spiritual, and intellectual characters as well. It is a little difficult for the scientifically trained psychologist of the " hard-headed variety " to sit silently by and hear such statements made so confidently. They may appeal to the basis of the " comity," namely, the white race present in him, but at the same time, since his scientific mind is neither white, nor black, nor even red, it cannot act on this basis, for it must have proof. It is a bit disconcerting to read further and find toward the end of the writer's argument the statement that white men (p. 229) must get the idea of Asiatic inferiority out of their heads, for the brown and yellow peoples are gifted, and have profoundly influenced human progress. But for this last statement we might have little difficulty in placing the writer as standing for or against the equality of at least these races.

Most of the writers treating the subject of race theoretically have not been psychologists in the strict sense of the word. It is now time to quote one such, and this is Professor Wm. McDougall, who comes directly to the point and places himself on record as thinking (64, p. 154) that there can be little doubt for believing in " great differences " in mental traits of races, and that these are probably persistent for thousands of generations. Yet he regards differences of temperament as perhaps the clearest (p. 7) and most generally recognized. In connection with the results of mental tests, we shall speak of McDougall later on.

One of the most vivid of these writers is Seth K. Humphreys (44), who has much to say of inherent values within a single race, and speaks thus of comparative racial values (p. 25): " Inequality of

races, of individuals within a race, within a community, within a family—that is the idea fundamental to the study of mankind." Again (p. 99), " mankind is divided into races primarily according to physical unlikeness; but dissimilarities of mental attributes and capacities are so clearly associated with outward physical differences that they enter an important factor in distinguishing races one from another." To be sure, the slow plodding experimental psychologist cannot follow this writer, who, like many of the other writers quoted, is continually running the risk of making hasty statements. The former would be more careful, and would prefer to make haste more slowly and cautiously, as compared with the theoretical writers. The writer goes on to remark that, " whether or not the mental attributes which have set up the white as the dominant race of the world were also once lodged with the yellow, the black, and other inferior races, and probably became lost through outbreeding during the milleniums of separation from the parent stock is a question as unanswerable as it is important. The outstanding fact is that they are not possessed of these attributes to-day. The search for racial ability to maintain the world's civilization need not go a step beyond the unmixed white " (p. 108). Again: " The active substance of civilization is involved with the destinies of a mere handful."

In direct opposition to the utterances of the foregoing anthropologists, sociologists, and psychologists, we have from *" Race and Nationality,"* by Oakesmith, avowedly a disciple of M. Jean Finot—who, to quote Oakesmith (72, p. 29), has laid the ghost of racial pride beyond resuscitation—the statement (*ibid*) that whenever the attempt is made to talk about the abstract " race " as if it existed in the actual world, we are faced by contradiction and halted by absurdities. He wants to know if there is a single intellectual or moral quality which can be safely regarded as the gift of a special race to its people. If so, all the members of the race should possess it equally. In the opinion of this writer a pure race is an abstraction, and in this case a racial characteristic would be something from which no member of a race could escape. Nationality is accounted for by environment, and he insists that to investigate race as an operating objective factor in the evolution of societies is both unscientific and unphilosophical.

The writer to be considered next is Carr-Saunders, who states, in *" The Population Problem "* (14, p. 397), that he sees no marked differences between the negro and the modern European. The differences are rather, he thinks, in disposition and temperament. The white man has initiative, inventiveness, versatility, and power of lead-

ership; the black man has humility, patience, loyalty, and self-sacrifice. Although these are signs of differences between these races, yet these differences are not remarkable, and further, the degree to which so apparently low a race as the Australian differs from the European is not in many cases much greater than the degree in which the negro differs from the European. Among the writers so far considered none have mentioned in their studies the experimental attack of the problem of racial differences in mental traits made by Woodworth and Bruner in 1904, nor any of the other experimental studies whatsoever. But Carr-Saunders seems to see some advantage in the experimental attack and gingerly takes into consideration the work of Miss Strong with the Binet Intelligence test on negroes, and the studies of Ferguson.

This must be quickly followed by a mention of McDougall's "*Is America Safe for Democracy?*" (64), which, along with contemporaneous studies, indicates a tendency to make much better use of the results of experimental investigations. In fact, in the foreword (p. vii) McDougall says very pertinently that most of the books have been written from the purely biological standpoint. He seeks, therefore, to bring together the findings of "mental anthropology, which are now beginning to be garnered on a large scale." But mental testing and its results do not incline this writer to shift from his original position of belief in innate racial differences in mentality.

Having thus made inquiry into the theoretical treatment of race psychology and indicated a transition toward a greater reliance on experimental studies on which to base conclusions, we now are ready to embark upon a review, for the span of time allotted to us, of the experimental attack upon the problem of race psychology.

Our first approach to the literature of the subject as found in the experimental studies had probably better be to find out how the problem is conceived by some of the investigators.

Because of the interest of the anthropologist, we record the following: "Don't set out measuring anything at all," says Karl Pearson before a group of anthropologists (74, p. 373), "until you have settled the problem you wish to answer." Again (p. 371): "In the present condition of affairs it is only too true that much of this work being psychometric will fall into the hands of the psychologist." "It is as much the duty of the anthropologist to measure the human mind as it is his duty to measure the functional actions of the human body—its dynamical characters. By dynamical characters I under-

stand such qualities as resistance to fatigue, facility in physical and in mental tests" (p. 372).

Hunter (46, p. 115) conceives the problem in this fashion: "It is undetermined as to what extent racial membership determines behavior through inherited nervous mechanisms. The essential problem is whether or not there are inherent differences in ability." "To what extent do the conscious experiences of the race differ, and why do they do so? What are the relative abilities of the different races when examined by the method of mental tests?" (p. 318)

Arlitt (4, p. 179) says that race norms that do not take the social status factor into account are apt to be to that extent unreliable.

Young proposes (108, p. 31) "to investigate by psychological tests and other measures the mental capacity of the children studied in certain schools and to discover whether their ability to master the traditional American education is due to (a) their alleged language handicap, or (b) the lack of native mental endowment which prevents their acquisition of the content of the curricula."

Peterson (76, p. 28) takes this stand: "Since even general intelligence tests are apt to measure opportunities to an unknown extent, as well as innate abilities, it is safe to apply them to the different races, for interracial comparison only with caution."

Brigham (11, p. 192–3) thinks that owing to the present stage of development of psychological tests, we cannot measure the actual amount of difference in the intelligence due to race or nativity. We can only prove what differences do exist, and we can interpret these differences in terms that have both social and economic significance. When our methods of measuring intellectual capacities have been perfected, we will be in a position to determine quantitatively the amount of difference."

Garth (26, p. 16) indicates that "the elements in the study of racial mental similarities or differences must be these: (1) Two so-called races, R_1 and R_2; (2) an equal amount of education and opportunity, E, which should include social pressure and racial patterns of thought; and (3) psychological tests, D, within the grasp of both racial groups. We should have as a result of such an experiment R_1ED equal to, greater than, or less than R_2ED."

Pintner (59, p. 349), in going over the data pertinent to our topic, asks us to keep two difficulties in mind: getting a fair sampling of any racial group in this country, and the inadequacy of language tests for foreign language speaking groups. "The difficulty of comparing different racial groups is largely one of setting adequate tests which

are equally fair to the groups to be compared. Nonverbal tests seem to the author to offer the only possibility" (p. 357).

Symonds (96, p. 442) advises that "we had better cast away our old blanket conception of racial superiority and consider superiority rather in terms of separate functions or groups of functions."

Thorndike (88, p. 570) says: "In many practical matters the upper limit of a group is as important as its average or typical status."

From the foregoing excerpts taken from a few of the many workers in the field of race psychology and from a survey of the literature in general, we may say in connection with the topic of the problem that in the minds of experimenters and students the problem is conceived in about the same way as it was in the period of activity previous to the one we are now examining. The only difference is in the matter of detail. If we may undertake to make a generalization it is this: The problem of race psychology to-day is conceived as an effort to (1) measure racial mental characters and behavior, which are (2) determined through racially inherited nervous mechanisms, (3) involving cautiousness in taking into account social status, and all facts of nurture and education, until we are (4) able to perfect tests that will measure innate abilities in spite of the presence of nurture; (5) to take care to secure really random samplings of the races studied, (6) to consider that possibly a "blanket" conception of racial superiorities are in error, and finally that (7) often the upper limit of a group is as important as an average performance.

Some of the writers, especially the earlier ones, do not emphasize the problem, it is true, and some do not seem to conceive it clearly; but the tendency now is to do this, and to make more careful consideration of the details of the same.

In order to present the facts of the experimental findings before the eye of the reader, we have had recourse to three tables, as I, II, and III. These will show certain interesting facts that would hardly be appreciated in any other than tabular form.

Upon looking at Table I, which is to be taken in connection with the bibliography at the end of this review, it will be seen that there have been made forty-five reports in which some phase of the subject of mental traits as different in races has been considered. These have been made by about thirty-five investigators either singly or in collaboration. As experimental basis for these reports, seventy-three (counting no group twice and not counting American whites) different racial groups have been the subjects of study.

Table II shows that the subject most studied is the American

negro, for there are reported twenty-five different experiments with various tests given him at various times. The next most studied group is one of the miscellaneous subraces, which might be, and often is called the "immigrant group." However, we should stipulate that the subjects were sometimes native born of foreign parentage. These have been the subject of twenty-three different experiments when they were either studied alone or together with others, their racial identity always being accounted for in the composition of the group. After these, there are eight studies of the American Indian, and six of the Chinese either in America, in Hawaii, or on their native soil. There are reports of four studies of Mexicans. The same table brings to light some interesting facts as to the trend in the activity of the investigators. In 1917 there were only two experiments reported, and these were: one on the Zulus in Africa and the other on negroes in America. Two were reported the next year, the subjects being negroes in America, and Chinese and Japanese. In the following year five studies were reported, four of which were on the American negro and one on Hindus. This was in 1919. The number of studies increased for the next three years, reaching an aggregate of nineteen experimental studies in 1922. This year was one of great activity, but in the year 1923 there were thirteen studies, and so far in 1924 sixteen studies have been reported. It will be seen that there has been, and still is, a great and growing interest in the question of race psychology among psychologists. It will be noted also that many races have been studied in the last five years that have never been studied before. Almost all races, in fact, have now been used as subjects of intelligence and psychological tests. While the American negro still is found to be the subject of much experimentation in the last eight years, *i.e.*, in twenty-five instances out of the total seventy-three racial studies, his popularity is being sharply contested by that of the immigrant group subjects, and slightly so by studies of American Indians, Chinese, Japanese, and Mexicans. That is to say, the trend is for the use of mental tests to spread over the whole world. Where investigations have not yet been made in the corners of the earth and isolated countries, we may soon expect to hear of their being carried on.

The next question after consideration of the races studied is naturally what mental processes have been studied and what kind of tests have been used in making these seventy-three racial studies. (See Table III.) The interest in differences in intelligence has always been uppermost, for of the seventy-three studies fifty-five

(over two-thirds) have been made on that phase of mental life called intelligence, if we may decide the question on the avowed purpose of the test. In addition, such conscious processes as memory, imagination, and association have been measured among the different races, as well as such dynamic characters as learning and resistance to fatigue, also will-temperament and esthetics. These last phases of the problem, the dynamics and esthetics, bid fair to contest the field with intelligence but possibly not to displace it.

As to the devices for testing, it is to be noted that the individual test in the form of the Binet-Simon, and the Stanford revision of the Binet, is to a rather decided extent giving way to the Group Intelligence test since the introduction of the Otis test and the widespread use of the Army Group tests. (See again Table III.) In the last eight years, of the racial studies made by intelligence testing eighteen have been with individual tests and thirty-seven with group tests. Also, the Group Psychological test has had a renaissance, especially in the last four years, and is competing sharply with the individual test of any kind in the field of race psychology.

Handling the data with a view to interpreting the results has always been a difficult task, and accordingly it will be to the point to note the trend in this respect. If we examine Table I we will quickly discern that the use of the I.Q. is becoming more and more the rule in expressing results, even the results of Group Intelligence tests. In the case of the group test the I.Q. must of necessity be an approximate I.Q., just a little precarious, perhaps, but it will prove to be such a useful means for such purposes of comparison that statisticians must find some means of making its use more safe. But this is not the only difficulty. We call attention to Peterson's recommendation (77) in speaking of the use of a common unit in the measurement of race differences, which is that of using quantitative units of the distribution of, say, the "white subjects," and thus to facilitate comparison with results of other tests. In this way we are independent of the absolute size of the scores in any particular test.

But what results are being found by these experimenters? What is their belief in consequence of their investigations? These are very pertinent questions. Has there been any change in the minds of psychologists as to the racial differences in mental traits in the last eight years? We shall take up the first of these questions as to the results found in respect to racial differences in mentality. The I.Q. of the negro is found to range from 83 to 103 in Binet tests. It would be hardly fair to take the approximate I.Q.'s given in Table I

for the group tests, since nearly all the subjects of these studies were southern negroes and do not represent a fair sampling. Results of army tests show the northern negro to be decidedly superior to the negro from the South, as has been shown by Yerkes, Trabue, and Brigham.

The army tests reveal (105, p. 21) the fact that the mental age of the colored draft was 10.4 years and that of the white draft 13.1 years, and that the overlapping of scores for colored individuals was between 10— and 12 per cent, according to Pintner (79, p. 341). If we separate the southern colored subjects from the northern colored subjects we find the overlapping on the white distribution for the former to be for Alpha about 6 per cent and for Beta 14 per cent, but for the latter it is respectively 31— or 34 per cent. According to Peterson (76, p. 134), "the intelligence of the negro race as represented in America is about that which will give him an I.Q. of approximately 75 to 80. The disadvantages of the negroes' inferior school and home environment and of his general social status, as these factors affect the test scores, will be at best partly balanced by the fact that there are results on colored subjects as found in America with a larger per cent of individuals containing white blood in varying degrees."

According to Yerkes (105, p. 364), the intelligence of the negro should be regarded as inferior to that of the white, and the southern negro is inferior to the northern negro, as judged by the results of army tests.

The inferiority of negro intelligence in comparison with the white is again brought out by results of studies of mulattoes, particularly as made by Ferguson (23, p. 541): "The results of the army intelligence tests showed that the negroes with the greater amount of white blood as indicated by skin color obtained uniformly higher average scores on a group test than those with less white blood."

Pintner (79, p. 345) regards such results as obtained as "sufficiently numerous and consistent to point to a racial difference in intelligence. The overlapping of the two races is great, and the most liberal estimate seems to be that, at most, 25 per cent of the colored equal or exceed the intelligence of the whites."

As respects some differences between whites and the American negro in other traits besides intelligence, we have this: In learning the negro is inferior (76, p. 133); in control of words they are superior, but in word-for-word reproduction they are not (93). In continuous mental work they show more inclination to warm up at

the start, and less disposition to resist fatigue than do whites (25, 26). Using the Downey Will-Temperament test, McFadden and Dashiell (63) found the negro's personality to be weaker than that of similarly tested groups of whites.

Results on tests for the immigrant groups, according to Brigham (11, p. 80), " indicate a general intellectual superiority of the Nordic group over the Alpine and Mediterranean groups." And again, according to Yerkes (106, p. 365), " for the past ten years or so the intellectual status of immigrants has been disquietingly low. Perhaps this is because of the dominance of the Mediterranean race as compared with the Nordic and Alpine."

Young (108, p. 95), who studied the Latin immigrant groups, as Italians, Portuguese, and Spanish-Mexicans, concludes that if the 100 I.Q. can be taken as the average for the Americans in terms of present grade status, the Latins are five-sixths of this amount and might be represented by an average I.Q. of 83."

In contradiction to these investigators we have this, from Feingold (21), who studied a large group of first generation immigrant groups: " The mental differences among American reared descendants of foreign races, viewed among themselves, are so small as to be practically insignificant." However, since the subjects of this study were all high school students, the principle of random sampling does not seem to operate sufficiently here, though the results are extremely interesting and valuable.

Hunter and Sommermier (45) and Garth (28, 29), in studying mixed blood Indians, obtained results consistent with studies of mulattoes, namely, that their average intelligence as measured is above that of the average full blood. Hunter found a positive correlation of .64 between the score in the Otis test and degree of white blood in his mixed blood subjects, using the following degrees of Indian blood: one-fourth, one-half, three-fourths, and four-fourths along with fifteen-year-old whites to represent no Indian blood. Garth found the performance of his mixed blood Indians, in using various psychological tests, to be on the whole 11 per cent better than that of the full bloods.

In a test for mental fatigue, Garth found (25, 20, 32, 34) that full blood Plains (nomadic) Indians excelled whites, mixed blood Indians, negroes, and full blood Plateau (sedentary) Indians in resistance to fatigue in a continuous performance of single columns of addition. In a study of color preference with whites (33) and full

TABLE I.

SHOWING EXPERIMENTAL WORK IN RACE PSYCHOLOGY SINCE YEAR 1916.

Date	Investigators	Race	No. Cases	Test	Results	Reference
1917	Loades and Rich	Native Africans—Zulus.	243	Binet (adap)	No definite measure of difference.	59
1917	Sunne	Negroes	126	Binet and Yerkes	White overlap 1 year older mentally.	93
		Whites	112			
1924	Sunne	Negroes	1112	N.I.T.; Myers Mental Measurement.	White 1 to 1½ years older, N.I.T. overlap of Negro 21%, Myers M.M.	94
		Whites	5834			
1919	Ferguson	Mulattoes	2288	Army Alpha, Army Beta	Score favors white blood.	23
		Negroes	155	Army Alpha nd Beta	Mental Age Negro 10.1 years.	
		White draft	.....		Mental Age White 13.1 years.	
1919	Pressey and Teter	Negroes	187	Pressey	Negro 2 years younger.	84
		Whites	1022			
1919	Trabue	Negroes	8244	Army Alpha	White better than Negro Average 1.18 P.E.	100
1920	Derrick	Negroes, college	55	Binet	Negro I.Q. 103.	19
		Whites, college	75		White I.Q. 112.	
1920	Murdock	Negroes	225	Pressey Group Standard	White better than Negro 85 P.E. units. White overlap 72%.	70
		Whites	514			
1920	Schwegler and Winn	Negroes	58	Stanford-Binet	Negro I.Q. 89. White I.Q. 103.	89
		Whites				
1921	Yerkes	Negro draft		Army Alpha and Beta	Negro M.A. 10.4 year. White M.A. 13.1 year; Negro overlap 12%.	105
		White draft				
1921	Arlitt	Negroes	243	Stanford-Binet	I.Q. increases with age.	4
1921	Arlitt	Negroes	71	Stanford-Binet	I.Q. 83 Negro. I. Q. 106 White.	5
		Whites	191			
1921	Haggerty (Va. Ed. Asso.)	Negroes	3000	General Intelligence Delta.	Negro overlap on White: Rural-19.9%. City-14.3%.	101
		Whites	13000			

1922	Pintner-Keller	Negroes	71	Binet	Negro I.Q. .88. White I.Q. .95.	78
		Whites	249			
1918	Lacy	Negroes	.....	Binet	85 (?).	52
		Whites	.....	Binet	95 (?).	
1922	Jordan, A. M.	Negroes	247	N.I.T.; Scale A	I.Q. .75, overlap 20-25%.	48
		Whites	1504			
1923	Brigham, C. C.	Negroes	.....	Army Alpha and Beta	Dif.−3.13±.0138 in favor of whites	11
		Whites	.....			
1923	Peterson	Negroes	734	Pressey	Negro I.Q. 75; Negro deficiency 1.35 Quotient units.	76
		Whites	641			
	Peterson	Negroes	115	Otis. Advanced	Negro I.Q. .58.	
		Whites	171			
	Peterson	Negroes	177	Otis. Primary	Negro deficiency 88 Quotient units.	
		Whites	357			
	Peterson	Negroes	37	Haggerty	Negro I.Q. .92?	
		Whites	71			
	Peterson	Negroes	90	Myer	Negro deficiency 1.70 Quotient units.	
		Whites	111			
1923	Thorndike	Negroes	349	I.E.R.	4% Negro reach Median of White.	98
		Whites	2653			
1923	Sunne	Negroes	1112	N.I.T.	M.A. Negro 1-1½ years below White. Average overlap 21% in Myers M.M.	94
		Whites	5834	Myers		
1919	Garth	Negroes	133	Mental Fatigue	Negro fatigue most—Indians least	25
1920		Whites	711			26
		Indians	190			
1919	Mitchell and Rosanoff	Negroes (Chil)	300	Kent-Rosanoff	Negro farther from adults. White Norm that White children.	67
		Whites (Chil)	300			
1921	Peterson	Negroes	315	Learning; Multiple Choice	95-80% of White surpass mind of Negro.	75
		Whites	311			
1923	McFadden and Dashiell	Negroes	77	Downey Will-Temperament.	Whites have stronger personality 15.4%.	63
		Whites	77			
1920	Murdock	Jews	489	Pressey	Jews, Americans Whites, overlap 53%. Italians inferior to Jews 15%.	70
		Italians	491	Pressey.		
		Americans White	485	Pressey.		

TABLE I.—*Continued.*

SHOWING EXPERIMENTAL WORK IN RACE PSYCHOLOGY SINCE YEAR 1916.

Date	Investigators	Race	No. Cases	Test	Results	Reference
1921	Arlitt	Italian	87	Binet	I.Q. .85.	5
		American White	191		I.Q. .92.	
1922	Pintner and Keller	Italian	313	Binet	I.Q. .84.	78
		Slavish	130	Binet	I.Q. .85.	
		Hungarian	90	Binet	I.Q. .89.	
1922	Brown	English	90	Binet	I.Q. 1.02.	12
		German	67	Binet	I.Q. 1.02.	
		Slavish	187	Binet	I.Q. 1.02.	
		Finnish	226	Binet	I.Q. .90.	
1922	Young	Italian	248	Army Alpha	I.Q. .88.	108
		Portuguese	75	Army Alpha	I.Q. .87.	
		Spanish-Mexican	53	Army Alpha	I.Q. .87.	
1923	Brigham	Nordic	3456	Army Alpha	Average Nordic less Average	11
		Alpine	4766	Army Alpha	Alpine 1.61 ± 0.04. Average	
		Mediter	4196	Army Alpha	Nordic less Average Median 1.85±0.4.	
1924	Davenport and Craytor.	Immigrant Stocks	102		Germans highest in leadership, pertinacity.	18
1924	Feingold	American,	1442	Mod. Army Alpha	Alp. Am., Av. rank of I.Q. 1.	21
		English-Scotch	112		2	
		Jews	862		3	
		Germans	119		2	
		Danish-Swedish	172		4	
		French	47			
		Irish	375		5	
		Polish	1112		6	
		Italian	251		7	
		Colored	92		8	

1921	Hunter and Sommermier.	Mixed and Full-Blood Indians.	715	Otis Int.	Correlation of +.41 between degree of white and Ind. blood.	45
1922	Garth	IndianMixedBlood		N.I.T.	Rank 1.	31
		Indian Full-Blood. of Plains.			Rank 3.	
		Indian Full-Blood of Plateau.			Rank 4.	
		Indian Full-Blood.			Rank 5.	
		Navajo.			Rank 5.	
		Mexicans.			Rank 2.	
1919	Garth	Indians	See above.	Fatigue.		25
1921	Garth	Mixed-Blood Indian.	215	Psy. Tests.	Mixed-Bloods excel Full-Bloods by 11%. Full-Bloods excel	28 29
		Full-Blood Indian.	165	Psy. Tests	Mixed-Bloods in resisting	
1922	Garth	Mixed-Blood Indian	82	Fatigue.	mental fatigue.	32
		Full-Blood Indian.	108	Fatigue.		
1923	Garth	Nomadic Indian	108	Fatigue.	Nomads excel Sedentary Indians in resisting mental fatigue.	34
		Sedentary	121	Fatigue.		
1922	Garth	Full-Blood Indian.	559	Color Pref.	Indian prefer Red, Blue, Violet, etc.	33
1923	Paschal and Sullivan	Mexican	410	In. Performance	Lower ½ of distribution favors American.	73
1924	Sheldon	Mexican	100	Stanford Revision	I.Q. .89.	90
		Whites	100	Binet and Cole Vincent	I.Q. 1.05.	
1920	Wolcott	Chinese	63	St. R. Binet	2-3 of I.Q.s are 100 and over.	102
1922	Yeung	Chinese	109	Binet	I.Q. .97.	107
1923	Murdock	Anglo-Saxon	60	N.I.T.	Anglo-Saxon excel in intelligence.	71
		Chinese	60	Seashore Pitch		
		Japanese	60	Discrimination.	Oriental high in morality test.	
		Portuguese	60	Morality		
		Anglo-Saxon	60			
		Hawaiian.				
		Chinese-Hawaiian	33		Musical ability high in Hawaiians	
		Korea	32			
		Porto Rico	32			
		Filipino	32			

and mixed blood Indians, he found apparent racial differences in this phase of esthetics.

Sheldon (90), who tested 100 Mexicans with the Binet-Stanford and Cole-Vincent tests, on 100 whites found an average I.Q. of 89 for the Mexicans and 105 for the whites. Paschal and Sullivan (73) used six performance tests and made anthropometric examinations on Mexican and American children in the public schools of Arizona. "The overlapping in the upper half of the distribution was larger from the median downward." The American children were superior. Other tests on Mexicans show them to be inferior to the whites.

On the study of the intelligence of the Chinese we have the reports of Walcott (102) in China, who used an adaption of the

TABLE II.

SHOWING PEOPLES STUDIED SINCE 1916.

	1917	1918	1919	1920	1921	1922	1923	1924	Tot.
Zulus	1								1
Negro (American)	1	1	4	3	4	3	7	2	25
Indians (American)			1		2	3	1	1	8
Mexicans						2	1	1	4
Chinese		1		1	1	1		2	6
Japanese						1	1	1	3
Hawaiian									
Hindu					2				2
Jews				1				1	2
Italians				1	1	2		1	5
Slavs						1		1	2
Hungarians						1		1	1
English-Scotch						1		1	2
Germans						1		1	2
Swedish						1		1	2
Finnish						1			1
Portuguese						1	2	1	4
French							1		1
Irish								1	1
Total	2	2	5	6	10	19	13	16	73

Binet; Young (107) in San Francisco and vicinity; Porteus (83), who studied them in conjunction with Japanese and Portuguese, using the Binet; Pyle and Creighton (85), using psychological tests; Murdock (71) in Hawaii, using National Intelligence tests on Anglo-Saxons, Chinese, Japanese, and other racial groups; and a very recent report by Symonds, who tested 513 Chinese in Hawaii. In all these tests, though Anglo-Saxons generally excel the Chinese, still the

latter obtain a very respectable rating. Symonds finds with Pintner's test an I.Q. of approximately 99.3. Miss Murdock finds them rating high in a morality test.

In 1922, Kubo translated the revised Binet into the Japanese language. Porteus (83) found the Japanese about equal to the Chinese when studied with the Binet. Miss Murdock finds them better in non-language tests than in language intelligence tests.

The only tests given to Hindus were by Waugh (103) and Herrick (40). The former used various psychological tests and found

TABLE III.

SHOWING KINDS OF TESTS USED SINCE YEAR 1916.

	1917	1918	1919	1920	1921	1922	1923	1924	Total
Ind. Int.	2	1	0	2	2	9	0	2	18
Group Int.	0	0	3	3	5	6	8	12	37
Psy. Ind.		0	0	0	0	0	1	0	1
Psy. Group		1	2	1	3	4	4	2	17
Total	2	2	5	6	10	19	13	15	73

the Hindus slightly better than the Chinese with whom he compared them. The latter studied Brahmins and Panchama students with the Goddard form-board and found both of them inferior to a white performance.

These studies taken all together seem to indicate the mental superiority of the white race. There may be some question, however, about the indicated intellectual inferiority of the yellow races. Altogether, it may be said that the investigators recognize that these experimental results are crude and so they must be taken tentatively. Nevertheless, they and all similar studies have real value, since they are the beginnings of the application of scientific method to the problem of racial psychology.

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DISCUSSION

REACTION TIME EXPERIMENTS

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In a "General Review of Reaction Time Measurements" (1), H. M. Johnson makes rather extended comments on the report of an investigation made by M. Elliott in 1920 and published in 1922 (2). From the nature of the criticisms made the reviewer is apparently laboring under a misunderstanding of the experimental conditions and results obtained. The starting point of this investigation was the fact in physiological optics, established by a long line of experimenters, but most clearly proven by the work of Bell (3) and Luckeish (4), that monochromatic light gives greater acuity of vision than white light, or continuous spectra light approximating white; also, that mercury vapor light closely approximates monochromatic light in this respect. This fact naturally suggested inquiry whether other visual effects, such as speed of discrimination and cognitive reaction time, might not accompany this increase in acuity; hence the experiments.

Briefly describing the apparatus, the reviewer states that "the stimuli were four-place numbers printed on 'white' paper. . . . The reflectivity of none of the surfaces is given." The quotation marks are an intimation that "white" is an indefinite or unscientific term. The quotation is incomplete; what was said in the report was "white bond paper." Mr. Johnson has evidently overlooked the fact that the differences in the coefficients of reflection of different makes of white bond paper are so small as to be practically negligible in any case, and for the purposes of this experiment absolutely without significance. The same applies to carbon black printing ink having a mat surface. Furthermore, the reflectivity of the surfaces in the visual field remained constant throughout the series of experiments, and as comparative results were sought the reflection coefficients had no influence whatever on the significance of the results obtained. There are too many unsolved problems awaiting the experimenter to justify any needless work on unnecessary details.

The reviewer states that the " chronograph was started when the stimulus was exposed, and was stopped by the subject's pressing a reaction key to indicate he had ' cognized the number.' " This is an error due to a misreading of the report. The chronograph was started at the beginning of a series of observations which consisted in reading in succession 120 of the four-place numbers and was stopped when the series was finished. The elapsed time of each observation was recorded in the usual manner as a distance between two " jogs " in the line traced by the recording pen. This method was used to facilitate computations, which was a matter of considerable practical importance owing to the large number of observations—some 47,000 in all. The instrumental errors were carefully determined, and found to be well within the requisite limits of accuracy. (See report.)

I must again quote somewhat at length from the review:

"After the subject had reacted, he pronounced the number to the experimenter, and if the response was correct the fact was taken as evidence that the subject had cognized the number at the instant he pressed the key or at a constant interval theretofore or thereafter. This assurance appears to have come through the channels of faith. To those lacking this medium of knowledge the weakness of the assumption would tend to invalidate any results which might be based on it. The use of an apparatus in which reaction is registered vocally by means of a voice- or lip-reaction key, actuated by the subject in pronouncing the number, would have lent greater weight to the results."

In the experiment the disappearance of the stimulus was simultaneous with the observer's touching the reaction key. To make it possible for the observer to repeat the number after it had disappeared, it was necessary for the stimulus to have been fully cognized. Ability to repeat the number thereafter operated as the physical check on the cognition. It is therefore impossible for the key to have been pressed *prior* to cognition. This disposes of one of the matters of " faith " by supplying the " medium of knowledge " which the reviewer overlooked. The other measure of faith was supposed to be the assumption that the key was pressed at a constant interval *after* cognition. The reviewer suggests that the use of a voice- or lip-reaction key actuated by the subject in pronouncing the number would have removed this source of doubt. He fails to explain why the muscles actuating the vocal organs or the lips are more trustworthy in this respect than the muscles actuating the fingers. The " medium of knowledge " necessary to prove this seems to be hope-

lessly lacking. If it cannot be assumed that a given muscle will react within a sensibly constant period in response to a given stimulus under given conditions then all reaction time experiments are worthless.

In discussing the case further the reviewer gives the following quotation from the experimental report:

"Preference for any one kind of light might affect results, but in this case the effects would necessarily be very marked, and would undoubtedly appear as wide and erratic differences in the reaction times. The fact that no such fluctuations appeared, but on the contrary the recorded times show a remarkable consistency, is sufficient evidence that they were not subject to the influence of prejudice."

He then offers as his criticism that the subjects might be operating under a preferential neuromuscular set which might express itself in a "consistently unequal preparedness for reception and reaction." The control of this factor is asserted by the reviewer to be of such importance as to invalidate any results obtained without giving it equal consideration with the control of the environmental situation.

Obviously this criticism reduces itself to a question of probability. The reviewer states that it is possible that the attitude of the observers toward the different lights might consistently influence the results. The reasons, set forth in the quotation from the report, still appear valid for believing that there could be no intentional or even conscious purpose operative. It is true that the nervous system, by virtue of its own bias, can direct and guide the course of consciousness, though the means of doing so are not themselves represented in consciousness; but the probability that such a predisposition existed in the present case and influenced the results is not so certain. In any case there is no reason to assume that a bias should be operative in favor of mercury vapor light, rather than either of the others used in the experiment, since mercury vapor light is a type of artificial illumination, highly unpleasant to many people, owing to its distortion of colors. The more logical assumption would be that the observers' neuromuscular set would be operative in such a direction as to favor either of the two other lights used in the experiment, especially daylight, to which they were naturally accustomed.

In conclusion, any attempt to invalidate experimental results by making a broad charge of commercialism is necessarily an appeal to personal opinion and not to fact. The evidence of experimentation must either stand or fall upon its own merits and not upon the manner in which the facts revealed may subsequently be used.

Furthermore, a series of observations extending through a period of eight months, under all variations of order of performance, seasons, times of day, and previous conditions of mental and physical labor of the observers, in the results of which they could have no possible pecuniary or other interest affecting their personal welfare, and which shows consistent results throughout, has at least a presumption of correctness in its favor, and must stand until conclusive experimental proof to the contrary is presented.

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REACTION TIME EXPERIMENTS; A REPLY

BY H. M. JOHNSON
Ohio State University

One point in the foregoing criticism I regard as important. What is to be the criterion of " cognition," that we may say at what time it has been accomplished?

My thesis is that a stimulus, such as a group of printed characters, may be regarded as having been " cognized " when, and not until, the patient shall have made a specific response to it. By the term " specific response " I mean a response which is different from the response which any other stimulus would arouse. One form of response which is suitable is vocal—the naming of the stimulus. It is capable of definite registration on the timing apparatus; it is quickly executed; it is socially acceptable. Had such a specific reaction been chosen to actuate the timing mechanism, and a vocal key used to record it, the temporal interval between stimulus and response would have represented the time required for cognition; subject, perhaps, to certain constant corrections which vanish in differential, though not in relative, comparison. The reaction chosen, namely, that of pressing a key, is not a specific one with respect to the several stimuli employed, and hence cannot be taken as marking the instant at which

any actual specific response was effected. Neither is there any means of ascertaining the temporal separation of the nonspecific reaction from the specific one.

I am not greatly impressed by the argument that the disturbance in the reaction-arcs which yielded the cognitional response could not have been started while the stimulus was exposed, and completed after the stimulus was covered. The duration of a flash of lightning, for example, is extremely short; and the simplest manual, postural or vocal response which it arouses is not completed until some tenths of a second have followed upon the flash.

My appraisal of Miss Elliott's data is based on the mode of experimentation she used, and not on the place in which the work was done, or the sources, if any, from which her remuneration was derived. My criticism of the advertising propaganda based on the experiment, springs from the fact that the data do not warrant the conclusions which have been drawn from them. It does not imply that a valid experiment would, necessarily, yield or fail to yield evidence of superiority of mercury-vapor light over tungsten in respect of speed of excitation. From consideration of some facts I should expect such a superiority; from consideration of other facts the contrary. The problem is of sufficient importance to justify a decisive test. The results from this one are irrelevant.

DEFINITIONS AND DELIMITATIONS OF PSYCHOLOGICAL TERMS, III

PREPARED BY A COMMITTEE OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

The two previous reports of this committee were published in the PSYCHOLOGICAL BULLETIN, **15**, pp. 89–95, and **19**, pp. 230–233.

The difficulty of reaching a unanimous decision regarding the exact wording of certain definitions has entailed lengthy correspondence and is responsible for the delay in preparing the present report. The committee felt that in the circumstances any further extension of its work was not feasible. Accordingly, at the 1923 meeting of the Association it asked to be discharged, which was so ordered. The Association authorized the publication of this final report, but is in no way committed to approve of the definitions.

TERMS CONSIDERED BY SUBCOMMITTEE: G & R

XI

52. **Cognition:**

a. The *process*[1] or function of noting and distinguishing *objects.*

b. Awareness of *objects.*

53. **Cognitive:**

Pertaining to *cognition.*

54. **Perception:**

a. Awareness of *objects,* qualities, or relations sensibly presented.

b. Interpretation of a complex present *experience* comprising both sensory and *ideational elements* by means of organized earlier *experiences.*

c. Attentive *awareness* of some present unified *experience.*

d. Awareness of the truth of a proposition.

e. Awareness of esthetic, ethical, or practical values in *objects,* situations, or events sensibly presented.

[1] Italicized words are used as defined in this or previous reports.

f. Sensory *awareness* of an *object* believed or assumed to be present at the given moment in such a manner that the *awareness* is, or could be, involuntarily shared with other *subjects*.

COMMENT: *Perception*[a] is sometimes termed "sense perception." *Perception*[d] and [c] represent historical usages of the term. According to more recent usage [b] may be construed to include both [d] and [e].

55. **Perceptual:**
Pertaining to *perception*.

56. **Apperception:**
a. Focused *perception* exhibited in the relative clearness of certain *sensory experiences* as compared with others.
b. The synthetic function of *mind* involving mutual modification of the presented *object* and preëxisting *mental dispositions*.

COMMENT: The term is disappearing from usage. It has had special historical significance in the writings of Leibniz, Kant, Herbart, and Wundt, and is current in the works of W. McDougall, Stout, Ward, and Warren.

57. **Apperceptive:**
Pertaining to *apperception*.

58. **Image:**
a. An *item of consciousness* in which the sensory elements of a *perceptual experience* recur in the absence of the original sensory stimulation.
b. An *object*, quality, or relation cognized but not directly presented by the *environment* at the given moment.

59. **Imaginal:**
Pertaining to *image*.

60. **Imagery:**
Images taken collectively.

61. **Idea:**
a. An *awareness* of any *object* not directly presented by the *environment* at the given moment.
b. The mental structure which in *cognition* selects and interprets its *objects*.
c. Complex *objects* and systems of relations cognized non-*perceptually*.
d. Synonym for *item of consciousness, mental process*[b], *experience*[a], *presentation*[b].

62. **Ideation:**

The *mental process* in which use is made of *images* and *ideas*.

63. **Ideational:**

Pertaining to *ideation* or to *idea*.

64. **Presentation:**

a. Any kind of immediate *experience* having an objective character.

b. Any *psychical object*—sensation, *perception, image,* concept, etc.

c. The *object* in the special form in which it actually appears in *perception* as distinguished from its *representation* in *idea*.

d. The *object* in the special form in which it appears at the moment of attending to it.

e. The function or *process* by which the *object* in any of the above senses is set before or presented to the *subject*.

COMMENT: The term is fairly equivalent to the German "*Vorstellung*." It is more characteristic of English systematic works than of American treatises. Stout uses it in sense [a] and Ward in sense [b].

65. **Presentative:**

Pertaining to *presentation*.

66. **Representation:**

a. The recurrence of a *presentation*.

COMMENT: Properly a re-*presentation*.

b. The *awareness* of an *object* which is not being sensibly perceived at the given moment; *idea*[a].

c. The mental *image,* sign, or symbol of an *object* which is not actually present in *perceptual experience*.

67. **Representative; Representational:**

Pertaining to *representation*.

68. **Imagination:**

a. The rearrangement of past *experience* into new connections or combinations.

b. An *idea* or group of *ideas*[b] together with a feeling of strangeness, or with the absence of the feeling of familiarity.

c. *Awareness* of an *object* which is believed or assumed to be present at the given moment and which is *experienced* in such a manner that the *awareness* is not involuntarily shared with other *subjects.*

69. **Imagination; Imaginational:**

Pertaining to *imagination.*

70. **Memory:**

a. *Consciousness* of past *experience* as past.

b. All influence from past *experiences* that *consciously* or *unconsciously* tends to affect present *experience.*

c. An *experience* which reproduces a former *presentation,* but which is not itself a *presentation*[a] or [c].

71. **Memorial; Mnemonic:**

Pertaining to *memory.*

72. **Recognition:**

a. *Perception* of an *object* together with a feeling of familiarity.

b. *Awareness* of an *object* as one that has been *experienced* before.

73. **Recognitive; Recognitional:**

Pertaining to *recognition.*

74. **Intellect:**

a. The capacity of conceptual knowledge.

b. The *cognitive* aspect of the *mind* involving the complex organization of its innate and acquired *cognitive* capacities; the capacity of knowledge.

c. The capacity to analyze and discriminate *objects,* situations, and events with respect to the relations involved in them.

75. **Intellectual:**

Pertaining to *intellect.*

76. **Intellection:**

a. The *process* of conceptual knowing.

b. The *process* of knowing; *cognition*[a].

77. **Intelligence:**

a. Ability to learn and to utilize in new situations knowledge or skill acquired by learning.

b. Selective adaptation through acquired knowledge.

78. **Intelligent:**

Implying or possessing *intelligence.*

79. **Thought:**

a. The *cognitive* function in general.

COMMENT: An historical usage, cf. Descartes' *"penser."*

b. Cognition above the *perceptual* level.

c. Cognition implying abstract concepts, or *consciousness* of universals.

d. Awareness that an *object* has this or that quality, relation, or reference.

COMMENT: Concidered as *mental element.* Cf. Bühler's *"Bewusstheit dass."*

e. Symbolic use of *ideas* and *attitudes* in the solution of a problem or in the execution of a task.

f. A general term which is used to designate the more complex form of non-*perceptual awareness,* e.g. *ideation, imagination, intellection, representation.*

With the exception of 61[b], to which Miss Calkins files an objection, these definitions and delimitations are unanimously accepted by the members of the committee as representing current and, in some cases that are noted, historical usage.

HOWARD C. WARREN, *Chairman*
MARY W. CALKINS
KNIGHT DUNLAP
H. NORMAN GARDINER
CHRISTIAN A. RUCKMICK

SULLIVAN, W. C. *Crime and Insanity*. N. Y.: Longmans, Green, 1924. Pp. 259.

Crime and Insanity is an expansion of the matter of a series of lectures delivered by the author during the past three years as part of the course of post-graduate psychiatry at the Maudsley Hospital. It was written primarily to fill a need for a textbook dealing specifically with the nature and extent of the influence of psychopathological conditions in the causation of those disorders of social conduct which come within the purview of the criminal law.

In the introductory chapter we find a very sane discussion of crime as a biosocial problem and a critical examination of some of the criminological theories. The essential fallacies of purely biological theories of crime are clearly indicated and the dangers of the method of investigation applied to "criminology in the mass." The conclusion is reached that when we go behind the general terms of *crime* and *criminal* to the actual facts which these terms connote, the only reliable method of investigating the biological factors of criminal conduct must be the slow and tedious way of clinical observation.

In a second chapter there is presented a rough psychological classification of indictable offenses. Crimes are classified under the following heads: Crimes of Acquisitiveness, Crimes of Violence, Crimes against Morals, Attempted Suicide, Arson and Malicious Damage and "Other Offenses." A table (adapted from the report of the Home Office) is presented which shows that 91.8 per cent of crimes fall in the first group—Crimes of Acquisitiveness. The relation of each of the three first categories of crime to insanity appears roughly, statistically, as follows: "Of persons guilty of crimes of violence, on the average, one is found insane in every twenty-seven; in crimes of lust, the proportion is one in every 160; in crimes of acquisitiveness, one in every 700." The relation of insanity to crime appears, thus, more important from a qualitative than from a quantitative point of view; insanity is responsible for only a trivial proportion of acquisitive crime, and therefore of criminality as a whole, but the categories of crime in which its influence is most considerable are the categories of gravest social and ethical importance.

The major portion of the book is devoted to a discussion of each of the major clinical forms of mental disorder, and an examination of the types of criminal conduct which are apt to occur in connection with each of them. A chapter is devoted to crime in each of the following mental disorders: *General Paralysis, Senile Insanity, Alcoholism, Manic-Depressive Insanity, Dementia Precox, Systematized Delusional Insanity, Epilepsy, Transitory Conditions of Mental Disorders, Hysteria, Congenital Mental Deficiency,* and *Moral Imbecility.* Illustrative case studies (fifty-two in all) appear in each of these chapters.

Following this survey of the facts of morbid crime, the practical problem of the relation of mental disorder to criminal responsibility is considered. There is a brief discussion of the nature and object of legal punishment in general, followed by a review of the evolution of the attitude of the English law concerning the effect of insanity on criminal responsibility. A final chapter, *Morbid Crime and Social Security,* offers a critical examination of the legal viewpoint concerning criminal responsibility from the point of view of the psychiatrist.

Although this book was produced by an English alienist, and in its purely legal aspects is concerned with the situation in England alone, yet in all other respects it has a universal applicability. It is admirably adapted for its original purpose, that of a textbook in morbid crime, and, in addition, the discussions are sufficiently nontechnical in style to be of value to the layman as well as to the two professions directly concerned, the medical and the legal.

Alice M. Jones

University of Pennsylvania

Pierce, Frederick. *Our Unconscious Mind.* N. Y.: Dutton, 1922. Pp. xi+323.

Mr. Pierce is no stranger to the lecture platform, and this book shows his ability to serve the popular taste, without, however, undue care to prevent a possible consequent indigestion. He concocts a pot pourri of psychoanalytic principles, endocrinology, and especially autosuggestion, and adds chapters on applications to the individual, the group, and to business (advertising and selling). This is done with an enthusiasm that carries him over gaps and disputed points, and with a flourish that includes the capitalization of such terms as "Unconscious," "Libido," "Censor," and "Ego Maximation."

While acknowledging freely his indebtedness to Freud (and hop-

ing for the day of autoanalysis), the author finds in the work of Coué and Baudouin the most effective means of directing unconscious activities. Very important here is the establishment of a conditioned reflex (" response-model "), which ultimately requires a minimum of attention. The " law of dominant affect " is presented as an addition to autosuggestion technique: "A suggestion, to get into action, has got to stimulate an affect which is strong enough to overcome any other then present, and thus preëmpt the right of way. The affect necessary to make any given suggestion become dynamic must supervene above all others and appropriate sufficient energy to dominate the conduct of the Unconscious " (p. 111).

More than half the book is taken up with practical applications of the " Unconscious," and in this connection the author has much of interest and sense to say, particularly concerning individual development and social problems.

R. W. Hall

St. Elizabeths Hospital

Fielding, William J. *The Caveman Within Us.* N. Y.: Dutton, 1922. Pp. xv+372.

This book, adapted to the lay reader, has for its thesis the dual nature of the personality, the primitive and the intellectual, and maintains that most of the ills of mankind are due to conflict between these components, and that an understanding and adjustment of this problem will add greatly to health and efficiency.

The author skims over the field opened up by psychoanalysis, and reviews in an interesting manner the history and workings of the primitive mind in the individual and in society. Probably superficiality is unavoidable in such a presentation, but certain topics—" insanity," for example—are treated with a cursoriness and with a generalization that are regrettable. Statements like, " It is always an unbearable emotional shock, or series of shocks, which produces the trauma or psychic wound resulting in insanity " (p. 185), and "As a general rule, the more thoroughly insane the person is, the more infantile he becomes in his actions " (p. 184), are liable to be misleading. Then again, to say (p. 102) that shell-shock " has to be abnormal, because it has been produced by a combination of abnormal circumstances," is scarcely illuminating.

Numerous illustrations are used throughout the book, and the great majority of them are pertinent and useful. There are exceptions, however. In the chapter on " The Caveman and the Genius,"

for instance, we are told shortly that Sir Joshua Reynolds, Heine, DeFoe, Copernicus, and Wickliffe were victims of paralysis or apoplexy. Just how this is a manifestation of the primitive mind, and goes to prove the presence of dual personality, is not so evident. The former may be true, though perhaps in a way the author does not appreciate. The point is a small one, but it exemplifies a tendency to sketchiness which is found elsewhere.

Mr. Fielding is well read, and his book is informative and helpful; it is much better than the title might indicate.

R. W. Hall

St. Elizabeths Hospital

Isabel Davenport. *Salvaging of American Girlhood.* N. Y.: Dutton, 1924. Pp. ix+302.

The book is based on the analysis of the tabulated questions obtained from 160 college girls, who submitted them with the assurance that they would be used anonomously.

This piece of research proves conclusively that a gross ignorance on matters of sex exists even among those whose environmental conditions have been above the average.

It is excellent propaganda in that it gives to the lay person some idea of the pathetic ignorance, resulting in warped ideas, which prevails among the majority of girls.

The author presents a solution for education along these lines which is theoretical but entirely possible.

M. C. Brooke

University of Pennsylvania

Pyle, William H. *Psychological Principles Applied to Teaching.* Baltimore: Warwick & York, 1924. Pp. vi+197.

The author believes that psychology has been of very little use to teachers because the "psychologists have not been sufficiently clear in their statement of principles, and have not been specific and definite in the application of the principles to concrete situations that arise in teaching." This statement is undoubtedly true, and it seems to the reviewer that one of the troubles has been that psychologists have not been willing to state the psychological principles without a great deal of argumentation in justification of their position.

Pyle, in the present volume, lists some 115 principles of educational significance in truly axiomatic form. They represent the con-

clusions which can be drawn from the great mass of work which is extant on the psychology of learning. After each statement of principle, the author gives a half dozen or more short paragraphs outlining educational situations to which the principle applies. A cross-reference to the different school subjects mentioned in the applications is very helpful.

This book should summarize and put in definitely usable form the material which the teacher has obtained in courses in general and in educational psychology, and by so doing should be of very great value.

SAMUEL W. FERNBERGER

University of Pennsylvania

STEDMAN, L. M. *Education of Gifted Children.* N. Y.: World Book, 1924. Pp. viii+192.

This book is the author's report on the results of a five-year teaching experiment in the "opportunity class" for gifted children, begun January, 1918, in the Training Department of the Los Angeles State Normal School.

Miss Stedman discusses very fully the practical problems encountered in the organization of such a class. She presents a most interesting series of case studies of the individual children composing her group, and presents in tabular and graphic form the comparative results of Binet test and retest, the Army Alpha, the Terman Group Test of Mental Ability, and a complete series of educational achievement tests. She has not, moreover, neglected the "human" side of her cases, and has presented a study of each child from the point of view of personality and social adjustment.

The last part of the book is given over to a discussion of group projects and activities. Since the methods of teaching the superior child are still largely in the experimental stage, Miss Stedman's rather detailed account of the methods which she has found most useful in the opportunity class represent a rather important educational contribution. The samples of the children's work which she presents are conclusive arguments in favor of the segregation of gifted children, in order that their originality may find adequate means of expression.

In a final chapter, Miss Stedman has summarized her conclusions concerning the nature of the superior child, and the most important factors to bear in mind in planning his educational program. Since

these conclusions are the result of practical experience, no educator who has in mind a like teaching experiment can afford to ignore them.

ALICE M. JONES

University of Pennsylvania

PINTNER, RUDOLF. *Intelligence Testing: Methods and Results.* N. Y.: Holt, 1923. Pp. v+406.

The author divides this treatise on Intelligence Testing into three parts: An Historical and Theoretical section; a section on Methods; another on the Results of Intelligence Testing. Each chapter is followed by a bibliography on the material covered in the chapter.

The first section includes a brief but well-developed account of the early history of intelligence testing, an appreciative description of the life of Binet, and a discussion of intelligence testing after Binet. A final chapter is devoted to the discussion of general intelligence, including a necessarily brief but clearly presented treatment of the various definitions of intelligence—its growth, distribution, methods of expressing intelligence ratings, and the fundamental principles involved in the standardization of intelligence tests.

A long chapter in the section on "The Scales" is devoted to a discussion of the various scales used in individual testing, with comments on each. No attempt is made to describe the innumerable intelligence tests that have not been combined in some special manner for obtaining an intelligence rating—generally of mental age. In addition to describing the original Binet scale and its American revisions, the author briefly describes the Pintner-Patterson performance scale, the Porteus scale, the De Sanctis scale, and a few others not directly based on Binet's work, as well as a few of the foreign scales. In spite of the author's explanation and his cross-references to Whipple's "*Manual of Mental and Physical Tests,*" the inclusive title of the book and the author's injunction that the "psychologist should be a master of all his tools and not a slave to any" suggests the need in this volume for at least a brief discussion of performance tests which, although they have not been included in scales, are nevertheless proving of great value in the measurement of intelligence.

The second chapter in this section is devoted to a discussion of the construction and a short description of group tests in common use. The chapter includes a table of age norms and grade norms for approximately twenty group tests which can be found very serviceable for comparative purposes.

Section 3 is devoted to a description of the various fields in which mental tests have been successfully used and a summary of the chief results in each field. Here the author discusses the results of mental tests applied to the feebleminded, the superior, the soldier, the school child, the delinquent, the dependent, the deaf, the blind, the negro, the foreign-born, and the employee. A chapter is devoted to each field and in each chapter is critically summarized the more important work which has been done in that field. The treatment is necessarily sketchy, but the relatively complete bibliography at the end of each chapter points the way to further knowledge for the interested student and layman. A final chapter is devoted to a discussion of the inheritance of intelligence.

This little volume on "Intelligence Testing" might be described as a handbook for the clinical psychologist. The point of view is not essentially clinical, but there is described in it a great deal of the material which the clinical psychologist must use and there are discussed findings with which he should be acquainted. The book might even be called a "Baedeker" of intelligence testing. It resembles a Baedeker not only in pointing out the high spots in intelligence testing, but in starring those which the author considers most important. With certain conclusions upon which the author places his star or even triple star of approval the reviewer disagrees. He feels, moreover, that a more impartial presentation of opinions (where there are differences) would have better served the purposes of this handbook, but even this fault does not detract seriously from the usefulness of this well-organized and well-written treatise.

MORRIS S. VITELES

University of Pennsylvania

MAXWELL, SAMUEL STEEN. *Labyrinth and Equilibrium.* Phila.: Lippincott, 1923. Pp. 163.

The aim of this volume is "to present an objective study of the equilibrial reactions of vertebrate animals and the mechanisms through which these reactions are produced." The author does practically all of his experimental work on selachians because the structures in question in these animals are large and easily reached by operative means.

The psychologist will find in the monograph no description of the consciousness which may be involved in the equilibrial reactions. The author does not believe that it is "necessary or desirable to

attempt to imagine the sensations of the experimental animal." From the psychological standpoint this work appeals primarily to those who are interested in comparative psychology in a purely objective way.

At the beginning of each chapter the author cites literature bearing on the particular question discussed in that chapter. He does not confine himself to simply summarizing the literature but discusses the technique and conclusions in a critical way. At the end of the monograph 249 references are listed, but the author states that "articles based wholly on clinical or psychological data have mostly been omitted."

The author first discusses compensatory motions and positions. His work is concerned with the dogfish. He lists the various movements and positions which the animal assumes when it is rotated around the three primary axes: the longitudinal, the transverse, and the vertical. "The effects of rotation in planes other than the primary are readily resolved and are seen to be the resultant of simultaneous rotations around more than one of the primary axes."

The next topic is that of forced positions and forced movements which are ordinarily observed as a result of injury to some part of the nervous system. He finds that many of these forced positions and movements may be caused by retinal and contact stimuli, and by holding the animal in certain positions. Of course, in the case of injury to the nervous system the forced position is more or less permanent while those induced by stimuli are temporary, lasting only as long as the stimulation.

With reference to the labyrinth as a whole, the author discusses the experiments which have been done in which one labyrinth was destroyed and those in which both labyrinths were extirpated. A great deal of work has been done along this line. The destruction of one is accompanied by forced positions and movements which, in general, are well known.

Maxwell finds that the destruction of both labyrinths in the dogfish does not cause any marked disturbances in the activity of the animal so long as it is not excited and is in a healthy condition. Loss of orientation occurs, however, in a labyrinthless animal if it is excited or is fatigued. Compensatory movements of the eyes and fins do not occur upon rotation of such an animal. Occasionally movements of the eyes are seen under such circumstances but the author believes that they are due to retinal stimulation.

It has been found by various investigators that, in many animals, certain other stimuli will produce reactions similar to those produced

by the stimulation of the labyrinth. The author found that tactual stimuli caused a movement of the tail and the fins of the fish. In many animals it is also found that retinal stimulations will produce various compensatory movements. A third source of such movements are the muscles and joints. For example, if the head of a dogfish is held so that there is no dynamic stimulation of the semicircular canals, and the tail is bent to one side, the eyes will turn immediately. The author points out the necessity of carefully distinguishing between such movements as these and those produced by the labyrinth.

The author studies the functions of the semicircular canals in two ways: (1) by stimulation; (2) by extirpation. He found that he could produce all the compensatory movements of rotation by mechanical stimulation of the various ampullae in the inner ear.

As he points out, however, we cannot "conclude from this that no other mechanism exists in the ear for the production of these movements."

The extirpation of the ampullae showed that such other mechanisms exist, for it is found that all compensatory movements except those in response to rotation in the horizontal plane can take place in the absence of the ampullae.

The next mechanism examined was the otoliths. The same two methods were applied to these as to the ampullae. The author found that in the animals upon which he worked there was no indication of a sharp differentiation of function between the otolith-bearing vestibular portion of the labyrinth and the semicircular canals. He also found that when all otoliths and all ampullae were removed the fish lost all compensatory movements and its geotropic reactions.

By means of stimulating the otoliths the author found evidence to indicate that the adequate stimulus for the sensitive cells in the vestibule is not a direct pressure of the otoliths upon them as commonly supposed, but rather a shifting of the otoliths. Furthermore, the direction of the compensatory movements to such a stimulus is determined by the direction of the displacement.

In a chapter on "The Mechanism of the Dynamic Functions of the Labyrinth" the author opposes the idea of Mach and others that the sensitive cells of the ampullae are stimulated by means of a current of endolymph in the canals owing to the inertia of that fluid when the head is rotated. On the basis of several experiments and the construction of a model, he comes to the conclusion that the sensitive portions of the ampullae are stimulated by the tension put upon

them when the head is rotated, due to the peculiar arrangement of cavities and membranes in the vestibule.

In the last two chapters of the monograph the author discusses the tonic effect of the labyrinth upon the muscles of the animal and a brief discussion of the phenomenon of nystagmus.

W. T. Heron

University of Kansas

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THE PSYCHOLOGICAL BULLETIN

I. GENERAL

535. KRÜGER, H., Zur philosophie des Ainesidemos von Knossos. Ein strukturpsychologischer Versuch. *Arch. f. d. ges. Psychol.*, 1924, **48**,148–173.

Strukturpsychologische Entscheidung über das Verhältnis des Ainesidem zu Heraklit auf grund eines bisher unerklärten Wortes, wonach das "Jetzt," sowie die "Zeit" δῶμα und ουδία sei, gleichsam Ainesidems "Urerlebnis": Nur der gegenwärtige Moment hat Realität; er ist die Usia, das wahrhaft Seiende. Diese völlig unantike Zeitauffassung verrät deutlich die idealistische Struktur seiner Philosophie: Alle Existenz besteht im augenblicklichen Erlebtwerden: esse = percipi! Diese Anschauung, die zweifellos, durch Ablehnung des herkömmlichen Substanzbegriffes, der Lehre Heraklits vom Flusse aller Dinge ähnelt, hielt Ainesidem irrtümlicherweise für identisch mit ihr, und da ihn die skeptische Tropenlehre zur Chronos-Usia-Theorie geführt hatte, bezeichnete er die Skepsis als Weg zum Heraklitismus. H. KRÜGER (Rostock).

536. LINDWORSKY, J., Revision einer Relationstheorie. *Arch. f. d. ges. Psychol.*, 1924, **48**, 248–289.

Nach genetisch-synthetischer Methode wird versucht, die Relationsbegriffe wie "gleich," "verschieden" usf. als Entwicklungsprodukte abzuleiten. Die Fähigkeit, einen anschaulichen Inhalt im Hinblick auf einen andern zu betrachten, das aktive Beziehen, ist ein letztes Datum. Geht aber das Subjekt von einem Inhalt zum andern beziehend über, so erlebt es ausser den bezogenen Inhalten noch

weitere anschauliche Inhalte und Sachverhalte. Manche dieser anlässlich des Beziehens erlebten Nebeneindrücke und Begleitsachverhalte kehren wieder, wenn der Uebergang zwischen objektiv gleichen Inhalten stattfindet; andere kehren wieder, wenn der Uebergang zwischen objektiv verschiedenen geschieht usf. Die so wiederkehrenden Begleiterlebnisse bilden zusammen mit dem Sachverhalt, dass sie beim Uebergang zwischen zwei Inhalten erlebt werden, einen Komplex, und dieser Komplex ist eben der Relationsbegriff. Eine Auseinandersetzung mit anderen Relationstheorien und eine Skizzierung der weittragenden Folgerungen dieser neuen Theorie schliesst sich an. J. Lindworsky (Köln).

537. Kafka, G., Zum Begriff des "Psychischen" und seiner Entwicklungsgeschichte. *Arch. f. d. ges. Psychol.*, 1924, **48**.

Im Begriff des Psychischen sind seiner Natur nach von jeher 3 Unterbegriffe, die des Subjektes, des Aktes und des Objektes, enthalten und mit einander verflochten. Diese Begriffe, ursprünglich vieldeutig gefasst und ungesondert zusammengedacht, streifen im Lauf der Entwicklung immer mehr unwesentliche Merkmale ab und lassen die zwischen ihnen bestehenden Beziehungen immer reiner hervortreten, so dass schliesslich der Begriff des Psychischen nur mehr aus dem Inhalt jener Beziehungen zu erfassen ist. Abschliessend wird das Verhältnis der Begriffe des Psychischen und des Bewusstseins erörtert. G. Kafka (Dresden).

538. Child, C. M., The Problem of Pattern in Organisms. II. The Physiological Gradients. *Amer. Nat.*, 1924, **58**, 32–2336.

Another interesting discussion, covering too much ground to review effectively, but covering the following problems in a general way: The physiological gradients as factors of pattern; dominance and subordination in relation to the gradients; the origin of the physiological gradients; the problem of surface-interior pattern; organismic pattern and the chromosomes. It is recognized that the nuclear substance is of fundamental importance in relation to the specific hereditary constitution of the protoplasm of a particular species, but this constitution, the author believes, represents not organismic pattern, but the material or substratum on which this pattern is superimposed as a physiological order which merely determines what potentialities shall be realized and where each realization shall occur. There is no necessary conflict between this conception

of organismic pattern and the theories of chromosomal pattern. For the realization of different potentialities in different cells or cell groups, all of which originally possess all the potentialities, a pattern on a larger scale is necessary, and this pattern must be of external origin. R. H. WHEELER (Oregon).

539. CHAMBERLAIN, J. C., Concerning the Hollow Curve of Distribution. *Amer. Nat.*, 1924, **58**, 350–374.

A most interesting paper dealing with the difficulties of interpreting statistical data. While the problems are too numerous and technical to review here, it is worth mentioning that the problem involved in general is the old one of reading from curves back to nature in the absence of adequate, qualitative knowledge of nature. The spirit of the article is condensed in the statement: "It is only too apparent that many biologists, if not openly contemptuous of ———, the systematist, seem to forget that *his* is the tie that binds, in large part at least, whatever information their own researches have yielded into the general fabric of our biological knowledge." R. H. WHEELER (Oregon).

540. HUMPHREY, G., The Psychology of the Gestalt. *J. Educ. Psychol.*, 1924, **15**, 401–412.

The Gestalt theory as given is, very briefly, that psychology should be the study of whole processes and their interactions, which we experience, rather than of simple sensations and other artificial units which we never experience. Thus is established a new kind of psychological unit, one which further division alters, though artificially it may be subdivided. Wertheimer, Köhler, and Koffma are named as the chief exponents of the system which Humphrey estimates to be of established though unmeasured value. The Gestalt theory springs directly from experimental work and has proved very fruitful in presenting hypotheses for further experimentation. In educational psychology it promises to throw light on such problems as reading, transfer of training, maze learning, etc. It has already aroused considerable speculation in the general theory. Humphrey gives a thorough, brief criticism which is worth reading. S. D. WEINLAND (Lehigh).

541. SHEN, E., The Standard Error of Certain Estimated Coefficients of Correlation. *J. Educ. Psychol.*, 1924, **15**, 462–465.

When the reliability coefficient of a test is determined from the correlation between its two halves by means of the Spearman-Brown

formula, certain assumptions are involved and its standard error is greater than that given by the ordinary formula for the standard error of a correlation coefficient. And again when the correlation coefficient between two tests or two functions is "corrected" for attenuation, it is also a case of estimation and involves certain assumptions. In order that specific formulae may be available for such cases, they are here derived and explained. S. D. WEINLAND (Lehigh).

2. NERVOUS SYSTEM

542. LASHEY, K. S., Studies of Cerebral Function in Learning. V. The Retention of Motor Habtis After Destruction of the So-Called Motor Areas in Primates. *Arch. of Neurol. and Psychiat.*, 1924, 3, 249–276.

"The greater part of the precentral gyrus of both hemispheres was destroyed in monkeys which had been trained previously in habits of manipulation and visual discrimination. When the animals recovered from paralysis, it was found that they showed perfect retention of these habits. From this it is concluded that the so-called motor areas are not directly concerned with the performance of complex learned activities. The motor impulses of conditioned reflexes must descend from other areas of the cerebral cortex than the precentral gyri, and the latter cannot be regarded as the source of impulses to 'voluntary movements.' Destruction of the corpus striatum subsequent to recovery from diplegia produced only the usual symptoms of striate lesion without recurrence of the symptoms of cerebral paralysis. Recovery from paralysis was therefore not due to vicarious function of this nucleus. The evidence for considering the precentral gyrus as a part of the kinetic mechanism for reflex control of spinal posture and for maintenance of excitability of lower motor centers is summarized." W. P. MCELROY (Boston Psychopathic Hospital).

543. POLLOCK, L. J., and DAVIS, L. E., Studies in Decerebration. II. An Acute Decerebrated Preparation. *Arch. of Neurol. and Psychiat.*, 1924, 3, 288–293.

A description of the behavior of cats after decerebration by rendering certain parts of the nervous system anemic. The method (as described in the first article of the series) consisted of ligature

of the basilar and carotid arteries. W. P. McElroy (Boston Psychopathic Hospital).

544. Müller, A., Das Individualitätsproblem und die Subordination der Organe. (Zugleich ein Beitrag zum Descensus der Keimdrüsen der Säugetiere.) *Arch. f. d. ges. Psychol.*, 1924, **48**, 290–381.

Darlegung einer Rangordnung der tierischen Organsysteme nach ihrer ganzmachenden Funktion, ihrer Bedeutung für die Ganzheit des Organismus (Cuvier); stärkste Ordnungsausprägung innerhalb des Zentralnervensystemes. Im polaren Gegensatz zu diesem synthetischen Princip stehen desintegrierend, auf "*Fort*" pflanzung gerichtet, die Generationsorgane. Die Rangordnung besonders im ZNS findet sinnlichen Ausdruck in den Lagebeziehungen der Teile zum Achsensystem des Wirbeltierkörpers: die höchsten Funktionsträger des ZNS gravitieren nach dem kranio-dorsalen Ort. Die Keimdrüsenverlagerung der Säugetiere vom Entstehungsorte nach dem abordalen Orte wird—nach Begründung künstlerischer Ausdruckstendenzen in den Organismen und Ablehnung des biologischen Utilitarismus—als Ausdruck ihrer "negativen Ganzheitsbezogenheit," ihrer polaren Entgegensetzung zur Funktion des ZNS, dargelegt. A. Müller (Leipzig).

545. Addison, W. H. F., A Comparison of the Cerebellar Tracts in Three Teleosts. *J. Comp. Neurol.*, 1923, **36**, 1–36.

The cerebellum of fishes is very different in its afferent connections from that of mammals. While in mammals the cerebellar impulses are principally of a proprioceptive nature, in teleosts the impulses come also from visual, lateral-line and tactile centers, and possibly from gustatory and olfactory regions. It follows that the cerebellum, in its phylogenetic development, has lost its connection with external sense-organs and has become a more internal organ. The above are a few of the suggestions advanced by the author as a result of his work on fishes in which he finds, in different species, a considerable variation in the cerebellar tracts. R. H. Wheeler (Oregon).

546. Larsell, O., The Cerebellum of the Frog. *J. Comp. Neurol.*, 1923, **36**, 89–112.

The fiber-tract connections with the cerebellum include a direct trigemino-cerebellar tract, vestibulo-cerebellar and direct vestibular

tracts, spino-cerebellar, tecto-cerebellar and bulbo-cerebellar tracts, besides brachium conjunctivum and cerebello-tegmental fibers. The trochlear nerve sends some uncrossed fibers directly into the cerebellum. These appear to become related to the mesencephalic V tract which also passes through the organ. R. H. Wheeler (Oregon).

547. Detwiler, S. R., Studies on the Retina. The Identity of the Developing Visual Cells in Amblystoma Larvæ as Revealed by Their Responses to Light. *J. Comp. Neurol.*, 1923, **36**, 113–124.

cells suggested that the large conical-shaped elements are gradually transformed into typical rods and that these rod progenitors are in no way to be regarded as cones. (Detwiler and Laurens, 1921.) The results of these experiments are contrary to the conclusions advanced by Bernard (1903) and Cameron (1905, 1911), viz., that in the amphibian retina cones represent early stages in the formation of rods. Although in early stages all of the developing cells are cone-shaped, those which differentiate into rods not only present different structural features from those of the true cones, but they fail to execute the characteristic cone responses to photic stimulation, and behave as fully formed rods. R. H. Wheeler (Oregon).

548. Detwiler, S. R., Studies on the Retina. An Experimental Study of the Gecko Retina. *J. Comp. Neurol.*, 1923, **36**, 125–143.

The retina of this nocturnal lizard (*Gecko swinhonis* Güenther) contains single and double rods and is entirely devoid of cones. Illumination of the retina by diffuse daylight brings about a migration of the epithelial pigment which averages 5.6$\mu\mu$, a result not in harmony with Garten's (1907). R. H. Wheeler (Oregon).

549. Johnston, J. B., Further Contributions to the Study of the Evolution of the Forebrain. V. Survey of Forebrain Morphology. *J. Comp. Neurol.*, 1924, **36**, 143–192.

Recent investigations have thrown a great deal of light upon the continuity of phylogenetic development of brain structure. New structures have not appeared, and although old structures have been modified, the process of evolution leading to the human brain has been one of gradual development of the elements inherent in the structures or areas laid down in very early vertebrate ancestors with

gradual shifting of emphasis, growth, or decline of this or that element, all under the influence of environment and changing habits. This is true of the following structures, of each of which we now have a fairly complete history: medial and lateral olfactory centers and hippocampal formation; amygdaloid complex; corpus striatum including putamen, globus pallidus, nucleus caudatus, bed of stria terminalis; general cortex or neopallium and the fiber systems connecting the telencephalon with lower centers. Future studies must be directed to the details of the differentiation of these structures and their modification in response to changes in environment, habits, and peripheral sense organs. R. H. WHEELER (Oregon).

550. LANGWORTHY, O. R., A Study of the Innervation of the Tongue Musculature with Particular Reference to the Proprioceptive Mechanism. *J. Comp. Neurol.*, 1924, **36**, 273–298.

Neuromuscular spindles were demonstrated in the extrinsic tongue musculature of the cat, pig, opossum and rat. A physiological experiment with histological controls was devised in order to determine what nerve carried these afferent fibers. It was found that bilateral section of the lingual and glossopharyngeal nerves in the cat caused no apparent ataxia of the tongue. Normal neuromuscular spindles could be seen, subsequently, in the musculature. Complete paralysis of the tongue followed bilateral section of the N. hypoglossus. Then, after time had been allowed for degeneration, no neuromuscular spindles could be demonstrated in the muscle. Accordingly, the N. hypoglossus was assumed to carry proprioceptive fibers. Small sensory ganglia are found connected with the N. hypoglossus with fair constancy in the cat, dog, rabbit and other animals and very rarely in man. After cutting the hypoglossal nerve in the cat this ganglion shows changes of degeneration. But the cells of the ganglion do not seem numerous enough to account for all the neuromuscular spindles and as the ganglion is so inconstant further search must be made for sensory cells whose fibers run in the N. hypoglossus. R. H. WHEELER (Oregon).

551. HILTON, W. A., Afferent and Efferent Pathways in an Abdominal Segment of an Insect. *J. Comp. Neurol.*, 1924, **36**, 299–308.

Working on larvæ of the beetle *Dendroides* the author draws the following general conclusions: Nerve fibers may be so small

as to be almost beyond the limit of visibility; in the use of this animal distinctions between fiber and fibril are not possible; there are two sets of receptor cells, both bipolar, one connected with muscle fibers and a much larger number related to hollow sense hairs. A large number of the dorsal and lateral sense hair cells send their processes to the ganglion of the segment but these turn at once toward cephalic regions. In case of receptor cells neurons do not seem to be fused, but there is a possibility of a number of effector cells combining to supply a single muscle fiber. Each ganglion is an automatic center but one-third of the fibers are ascending and descending. R. H. Wheeler (Oregon).

552. Larsell, O., The Nucleus Isthmi of the Frog. *J. Comp. Neurol.*, 1924, **36**, 309–322.

The nucleus isthmi appears from its connections and relationships clearly to correspond, in the frog, to the medial geniculate body of mammals. R. H. Wheeler (Oregon).

553. Johnson, G. E., Giant Nerve Fibers in Crustaceans, with Special Reference to Cambarus and Palaemonetes. *J. Comp. Neurol.*, 1924, **36**, 323–374.

The median giant fibers of *Cambarus, Crangon,* and *Palaemonetes* terminate anteriorly in the brain, where they decussate and probably end in cell bodies. Posteriorly they end in the last abdominal ganglion. Large branches occur only near their terminations. They are in association with certain efferent fibers (the motor giant fibers) in the posterior part of the thorax and in the abdomen. The association is either one of contact between the fibers themselves or one attained by means of short branches extending from the one to the other. Segmental (lateral) giant fibers occur in each thoracic and abdominal ganglion. Each terminates posteriorly in a ganglion and anteriorly it passes through the next ganglion, terminating in contact with the side of a similar fiber which has its posterior terminations in that ganglion. The relations between the segmental giant fibers are those of contact with short blunt branches in the case of *Cambarus* and of partial fusion of the anterior end of one with the side of the other in *Palaemonetes* and *Crangon.* These associations differ strikingly from the synapse as commonly described. The relationship is not that of a nerve net. It forms, therefore, a strikingly unique alliance between neurons. It is suggested that contact and fusion

may be only differences in degree of association of neurons and that it would not be impossible to have both in the synapse. R. H. WHEELER (Oregon).

554. GRAY, P. A., and TURNER, E. L., The Motor Cortex of the Opposum. *J. Comp. Neurol.*, 1924, **36**, 375–386.

On the relatively simple and primitive forebrain of *Didelphys virginiana* (9 cases) the authors applied a current from an inductorium driven by two dry cells. The animal was suspended so that the head, limbs and tail hung freely. Tests were made with a unipolar platinum electrode (bipolar electrode used in one case) 15 minutes after operation. A systematic search over the entire surface of the cortex has thus far failed to reveal any center for hind-leg or tail movements. This seems to be in accord with Cunningham (1898), but Herrick and Vogts have described a center for hind-leg movements. The present investigation is confirmed by Rogers (1923), and by histological examinations of the pyramidal tract. Maps are presented. R. H. WHEELER (Oregon).

556. TURNER, E. L., The Pyramidal Tract of the Virginia Opposum (Didelphys virginiana). *J. Comp. Neurol.*, 1924, **36**, 387–398.

The same animals used as in Gray and Turner (375–386), four of which were operated upon aseptically, and after localization, the motor area was extirpated and the animals allowed to live a sufficient time for degeneration to take place. The corticospinal tract of the opossum occupies a position similar to that found in the other mammalian orders in the upper part of its course. The decussation of this tract in the lower part of the medulla seems to be complete. There is a center for fore limb, head and neck movements in the cortex, but no center for the hind limbs and tail. This fact, together with the lack of degeneration below the decussation and the appearance of contractures where the striatal body had been irritated, suggests that the hind-limb center is located at some level below the cortex. Possibly there is a synapse in the corticospinal system at this level. There are fibers here which turn laterally and probably make connections in the gray matter. Possibly unmyelinated fibers are present, forming no compact tract, and are too scattered to be defined by the Cajal and Ranson silver stains. R. H. WHEELER (Oregon).

557. Allen, W. F., Distribution of the Fibers Originating from the Different Basal Cerebellar Nuclei. *J. Comp. Neurol.*, 1924, **36**, 399–440.

This is a continuation of the author's work on the central visceral system of the guinea pig with special attention paid to the intermediate and basal nuclear masses. R. H. Wheeler (Oregon).

558. Dart, R. A., Some Notes on the Double Innervation of Mesodermal Muscle. *J. Comp. Neurol.*, 1924, **36**, 441–494.

The double innervation (somatic and sympathetic) of striated muscle is vindicated by all lines of inquiry—anatomical, physiological, clinical and experimental. The sympathetic nerves in mesodermal muscle are both sensory and motor. There are intrafusal muscle fibers of muscle spindles and these, also, are doubly innervated, one of the fibers being the coarsely myelinated somatic sensory nerve fiber and the other being a finely myelinated sympathetic nerve fiber. The author believes that muscular tonus is fundamentally sympathetic in its origin and that the "stair case" phenomenon may be due to a summation of tonus. He also associates the sympathetic innervation of voluntary muscles with the alleged protopathic system. The fact of double innervation has not received the attention which it deserves. It may mean a new conception of the physiology of the voluntary muscle. It is also part of a phylogenetic issue of wide application. The sympathetic apparatus could not possibly have been derived from the segmented system phylogenetically and it is not so derived ontogenetically. (This is an interesting and highly suggestive discussion with possibly some important bearings on the neurological concepts interpretive of behavior.) R. H. Wheeler (Oregon).

559. Hammett, F. S., Studies of the Thyroid Apparatus. XX. The Effect of Thyroparathyroidectomy and Parathyroidectomy at 75 Days of Age on the Growth of the Brain and Spinal Cord of Male and Female Albino Rats. *J. Comp. Neurol.*, 1924, **37**, 15–30.

Sex and age are factors of importance in the determination of the type and degree of response in growth of the brain and cord to thyroid and parathyroid deficiency. The brain is more dependent upon thyroid function for its normal quantitative growth and qualitative differentiation than is the cord. This difference is interpreted

primarily on the basis of the relative time of appearance of the spinal cord, thyroid gland and brain during the course of phylogenetic evolution. It is secondarily interpreted by the differences in relative dependency of cytoplasmic and lipoid metabolism on thyroid function. The central nervous system is more resistant to the toxemia of parathyroid deficiency than is the body as a whole. R. H. WHEELER (Oregon).

560. NICHOLSON, H., On the Presence of Ganglion Cells in the Third and Sixth Nerves of Man. *J. Comp. Neurol.*, 1924, 37, 31–36.

Ganglion cells, evidently sensory in nature, are demonstrated on the root of the third nerve of a full-time foetus, confirming Thomsen (1887). A ganglion is also found on the trunk of the sixth nerve, thus explaining why Sherrington and Tozier (1910) found sound fibers in the external rectus (monkey, cat, rabbit), upon intracranial severance of the sixth nerve. R. H. WHEELER (Oregon).

561. COGHILL, G. E., Correlated Anatomical and Physiological Studies of the Growth of the Nervous System in Amphibia. III. The Floor Plate of Amblystoma. *J. Comp. Neurol.*, 1924, 37, 37–70.

The beginning of the response to touch, marked by movement away from the stimulus, is correlated with and dependent upon the nervous function of floor-plate cells, in the region of the fifth and adjacent myotomes and at the levels of the roots of the fifth and seventh cranial nerves. The development of the behavior pattern up to swimming is distinctly correlated with the further development of this commissure, which is formed exclusively of fibers arising from cells in and immediately adjacent to the floor plate. Nerve cells grow and function at the same time and the growth of specific neurons is correlated with definite elaboration of the behavior pattern. The synapse in its earlier functional condition occurs between loose brush-like endings of the fine spiral-pointed terminals that are structurally adapted to motility. R. H. WHEELER (Oregon).

562. HARRISON, R. G., Neuroblast Versus Sheath Cell in the Development of Peripheral Nerves. *J. Comp. Neurol.*, 1924, 37, 123–206.

The sheath cells have nothing to do with the formation of the axone, and the ganglion cell is the sole essential factor in its forma-

tion. The sheath cells are not mesodermal, but arise for the most part from the ganglion crest in connection with the spinal ganglia. Some arise later directly from the medullary cord by emigration along the ventral roots. The sheath cells are to be regarded as the neuroglia of the peripheral nerves. R. H. Wheeler (Oregon).

563. Gray, P. A., The Cortical Lamination Pattern of the Opossum, Didelphys virginiana. *J. Comp. Neurol.*, 1924, **37**, 221–264.

The cortical lamination pattern is described in detail. Among the author's conclusions is the statement that the opossum is an exception to the generalization that the " motor " cortex is agranular in type. R. H. Wheeler (Oregon).

564. Rogers, F. T., An Experimental Study of the Cerebral Physiology of the Virginian Opossum. *J. Comp. Neurol.*, 1924, **37**, 265–316.

Extirpation of the excitable cortex without traumatism of the corpus striatum is followed by weakness of the contralateral fore leg and difficulty in using the hand in climbing and grasping. These latter effects are temporary and disappear after a few days. The weakness persists for a longer time. Destruction of the excitable cortex and the underlying corpus striatum of one hemisphere leads to profound paralysis of the opposite fore arm and hand. In walking this leg may drag on the floor, the fingers are in state of persistent flexion and ulcers appear on the knuckles as a result of erosion. The animal is unable to climb. There is distortion of the head laterally so that the animal walks in circles. When put in forced positions, the animal is unable to use the leg and foot to prevent falling. Electrical stimulation of the corpus striatum fourteen days after complete destruction of the excitable cortex was followed by elevation of the head and extension of both fore legs. This fact, considered with that of the marked paralysis that follows the destruction of one corpus striatum, seems to indicate that the corpus striatum has motor functions particularly related, in this animal, to the muscles of the neck, shoulder, and fore legs. Since complete removal of both hemispheres is not marked by definite muscular paralysis of the spastic type, the motor disturbances following a unilateral lesion of the corpus striatum must be due to a loss of the balanced control normally exerted by the two hemispheres. Although reflex responses to olfactory, cutaneous and visceral stimuli may be elicited in the

absence of the general cortex, the normal reactions to light and sound are dependent upon cortical activity. Unilateral destruction of the occipital cortex with minimal damage to the thalamus is followed by blindness of the contralateral eye and no observable disturbance of vision of the ipsilateral eye. There is no hemianopsia such as follows similar cortical lesions of the higher animals. After a unilateral lesion of the temporoparietal cortex, no defects of behavior or loss of ability to respond to light, sound, or cutaneous stimuli could be detected. R. H. WHEELER (Oregon).

565. HERRICK, C. J., The Nucleus Olfactorius Anterior of the Opossum. *J. Comp. Neurol.*, 1924, 37, 317–359.

Cerebral centers from the nucleus olfactorius anterior to the hippocampus become progressively more highly elaborated, suggesting that in the development of the brain we have a collection of pictures of histological patterns in which there is in all cases a strong olfactory component and to which other functional systems are added in varying degrees of complexity. The specific nucleus in question is described in detail. R. H. WHEELER (Oregon).

566. CARPENTER, F. W., Intramuscular Nerve Endings of Sensory Type in the Small Intestine, with a Consideration of Their Probable Function. *J. Comp. Neurol.*, 1924, 37, 439–454.

A highly suggestive and important paper bearing on problems of sensory response by way of the automatic nervous system. Intramuscular nerve endings of sensory type occur in the wall of the dog's small intestine in the form of what appear to be arborizations. These may be the receptive terminals for tonic and regulatory reflexes or for persistaltic reflexes. They may, however, initiate through adequate stimulation nervous impulses arousing in consciousness the sensation of pain. This latter hypothesis is regarded by the author as the most plausible in the light of physiological evidence, reviewed in the text. R. H. WHEELER (Oregon).

567. DETWILER, S. R., Studies on the Retina. Observations on the Rods of Nocturnal Mammals. *J. Comp. Neurol.*, 1924, 37, 481–492.

The material consisted of three light adapted and three dark adapted eyes of field mice and of two light adapted and two dark

adapted eyes of the bat. These retinæ possess very slender cylindrical rods, with no evidence of cones. The rods do not show any positional changes in response to photic stimulation. The epithelial pigment is scanty in amount and fails to show any migration under the influence of light. Hence photomechanical changes in the mammalian visual cells and retinal pigment are very slight, if they occur at all. These phenomena, which take place so extensively in the lower vertebrates, apparently cannot be included as essential factors in any theory of vision or as participating in retinal adaptation in higher animals. Nevertheless statements to the contrary still appear in modern textbooks of anatomy and physiology. R. H. WHEELER (Oregon).

568. ALLEN, W. F., Localization in the Ganglion Semilunare of the Cat. *J. Comp. Neurol.*, 1924, **38**, 1–26.

Evidence goes to show that there are two separate and distinct ganglia in the ganglion semilunare of the cat, one the ophthalmic maxillary and the other the mandibular. If the situation in human beings is the same it has a clinical significance, for the mandibular ganglion can be destroyed without injury to the ophthalmic or the latter's motor root. Thus, in case of trifacial neuralgia involving the nervus mandibularis, the ganglion can be destroyed eliminating the pain without destroying the eyelid reflex. R. H. WHEELER (Oregon).

569. CRAIGIE, E. H., Changes in Vascularity in the Brain Stem and Cerebellum of the Albino Rat Between Birth and Maturity. *J. Comp. Neurol.*, 1924, **38**, 27–48.

A continuation of work published in Vols. 31 and 33 of this JOURNAL. Quantitatively the vascularity of the brain stem and cerebellum is much lower at birth than at maturity. The relative vascularity of centers within these parts does not differ at birth in the way it does in the adult. During the development of motor activity (second 5 days) vascularity increases. The rate of this increase reaches its peak from the 10th to 21st day. At this time the differences in vascularity of various centers characteristic of the adult become established. Vascular richness is related to functional activity and the latter requires a greater blood supply than processes of growth. R. H. WHEELER (Oregon).

570. Langworthy, O. R., A Physiological Study of the Reactions of Young Decerebrate Animals. *Am. J. of Physiol.*, 1924, **69**, 254–264.

Weed previously pointed out that kittens when decerebrated during the first few days of life as a rule show active reflexes and a tendency toward prolonged progressive movements. He also stated that decerebration of slightly older animals of the same species is followed by extensor rigidity, while active reflexes and progressive movements are very rare in these older animals. The present study extends the work of Weed by using, in addition to kittens, young rabbits immaturely delivered and young guinea pigs so maturely born that they were almost able to take care of themselves. The younger rabbits exhibited tremendous activity and prolonged progressive movements, which were often spontaneously initiated. Decerebrate rigidity was not manifested in these younger animals, but appeared in the older ones, where progressive movements are very rare. Rigidity begins to appear in such animals about the time they are able to support themselves on their legs. The guinea pigs, which were more mature at birth, with one exception, showed decerebrate rigidity and little tendency toward progressive movement. M. J. Zigler (Wellesley).

571. Laughton, N. B., Studies on the Nervous Regulation of Progression in Mammals. *Amer. J. of Physiol.*, 1924, **70**, 358–384.

The coördinated movements of progression in the cat and dog cannot be accomplished unless the caudal two-thirds of the thalamus is intact. In the rabbit the cephalic two-thirds of the pontine region takes care of progression. The cerebellum is not essential to progression in the rabbit. Marked rigidity did not inhibit progression in any of these animals. Coördinated progression movements could not be obtained from decapitated animals. M. J. Zigler (Wellesley).

572. Erlanger, J., and Gasser, H. S., The Compound Nature of the Action Current of Nerve as Disclosed by the Cathode Ray Oscillograph. *Amer. J. of Physiol.*, 1924, **70**, 624–666. M. J. Zigler (Wellesley).

573. Newton, F. C., Quantitative Measurements of the Excitability of the Central Nervous System After Thyroidectomy and Thymectomy. *Amer. J. of Physiol.*, 1924, 71, 12–18.

Total extirpation of the thyroid and thymus glands in rabbits leads to a diminished excitability of the central nervous system. This is indicated by a marked reduction in susceptibility of the respiratory center to rise in temperature. M. J. Zigler (Wellesley).

574. Morgulis, S., The Effect of Environmental Temperature on Metabolism. *Amer. J. of Physiol.*, 1924, 71, 49–59.

The general finding of these extensive experiments is that changes in temperature do not occasion changes in metabolic activity of the tissue cells, excepting in so far as low temperatures may induce shivering through external stimulation and high temperatures a state of heightened muscular tonicity, which is also induced by peripheral stimulation. M. J. Zigler (Wellesley).

575. McCouch, G. P., The Relation of the Pyramidal Tract to Spinal Shock. *Amer. J. of Physiol.*, 1924, 71, 137–152. M. J. Zigler (Wellesley).

3. SENSATION AND PERCEPTION

576. Quasebarth, K., Zeitschätzung und Zeitauffassung Optisch und Akustisch Ausgefüllter Intervalle. *Arch. f. d. ges. Psychol.*, 1924, 49, 379–432.

Es wurde die Dauer zweier optischer bezw. akustischer Reize von gleicher Qualität und Intensität beurteilt (Ruhender Lichtpunkt und Ton einer Mikrophonplatte). Normalzeiten (NZ) von 2–8 sec. Es ergab sich optisch Überschätzung, akustisch bei NZ von 2 sec Unterschätzung, bei grösseren NZ Überschätzung der variablen Zeit. Die phänomenologischen Probleme waren: Wo liegt die Grenze des unmittelbaren Dauerbewusstseins? und: Ist Dauer oder Sukzession das Wesentliche bei der Zeitauffassung? Die *Einstellung* zur Erfassung der Dauer *mit Aufmerksamkeitsspannung* behauptet das Feld bei den optischen Versuchen. Sie setzt jene Überschätzungstendenz. Bei den akustischen NZ von 2 sec implicierte die *Einstellung ohne Aufmerksamkeitsspannung* ein Wenigerbeachten der Zeit und hiermit Unterschätzung. Die Sukzession ist wohl die *notwendige*, aber keineswege die *hinreichende* Bedingung für das Erfassen der Dauer,

wie namentlich die langen Zeiten zeigten. Es scheint noch ein Rückwärtsgewandtsein, eine Beziehung auf den Anfang notwendig zu sein. Die Einheitlichkeit des Dauererlebens schwand optisch bei 6 sec, Akustisch bei 5 sec NZ. K. QUASEBARTH.

577. KIESOW, F., Zur Frage nach der Gültigkeit des Weber'schen Gesetzes im Gebiet der Tastempfindungen. *Arch. f. d. ges. Psychol.*, 1924, **47**, 1–13.

Die vorliegende Untersuchung bildet eine Fortsetzung derjenigen, über die schon in B. 43 des Arch. 1923 (S. 11–23) berichtet wurde. Die Versuche wurden unter sonst gleichen Bedingungen auf der Volarseite des linken Unterarmes, unweit der Ellenbeuge, ausgeführt, d.h. auf einer Hautstelle von geringer Dichte der Tastpunkte. Alle untersuchten Tastpunkte waren isolierte Haarpunkte. Die Untersuchung führte gleichfalls zu einer Bestätigung des Weberschen Gesetzes. Der Verfasser tritt damit der Ansicht *Hansen's* entgegen, der die Ergebnisse *Stratton's* auf die Ausbreitung der Deformation auf benachbarte Tastorgane zurückzuführen sucht. Nach dem Verf. handelt es sich bei den vorliegenden Versuchen (Dr. Gatti) wie bei denjenigen von Prof. Stratton um Intensitätsänderungen des Reizes. F. KIESOW (Turin).

578. NAGEL, R., Die Kontrolle der Konstanz einer heterochromen Helligkeitsvergleichung, insbesondere an der Hand des Korrespondenzsatzes für Äquivalenzwerte. *Arch. f. d. ges. Psychol.*, 1924, **47**, 143–218.

Zum Verständnis der quantitativen Ergebnisse gehört der Wirth'sche Begriff der "Korrespondenz" zweier vollständiger Reihen mit verschiedener Reizlage des konstanzen "Hauptreizes" H, bei denen der Hauptreiz der einen Reihe mit dem berechneten Äquivalenzwert der anderen übereinstimmt. Beide Reihen korrespondieren, wenn auch der zweite Äquivalenzwert mit dem Hauptwert der anderen Reihe zusammen fällt. Eine nicht rein zufällige Differenz ist das Doppelte eines Fehlers in der Bestimmung des Äquivalenzwertes. (Wirth, *Psychophysik*, S. 246 und Specielle Psychophysische Massmethoden (*Abderhaldens Handbuch*, 4. Lieferung, S. 272). Wenn die Reihen mit verschiedener Lage des H vergleichbar sein sollen, müssen sie mit zeitlicher Untermischung ihrer Einzelversuche gleichzeitig abgeleitet werden. Da hierbei die Äquivalenzwerte noch unbekannt sind, können die Abweichungen von der Korrespondenz nur interpolatorisch ermittelt werden, indem

man ein passendes System vollständiger Reihen mit systematisch abgestuften Hauptwerten gleichzeitig ableitet. Nagel untersuchte mit zwei Vpn. zum erstenmal ein solches System interpolierter Korrespondenzen für die heterochrome Photometrierung einer roten Pigmentscheibe, die auf einem Farbenkreisel neben Grau in einem Dunkelkasten 260 σ lang beleuchtet wurde. Vorversuche über die ungefähre Lage der Äquivalenzwerte liessen die roten bezw. grauen Hauptreize beider Reizlagen so abstufen, dass für beide Vpn. zusammen insgesamt 20 Korrespondenzen interpoliert werden konnten, deren mittlere Diskrepanz -0.0012 ± 0.0011 und $+0.0024 \pm 0.0015$ bei Vp. B. und N. als zufällig betrachtet werden kann. Diese gute Korrespondenz lässt die Berechnung der Äquivalenzwerte aus den Reizwerten (ohne Transformation nach einer psychophysischen Hypothese) nach den Spearman-Wirth'schen Formeln gerechtfertigt erscheinen, und zeigt vor allem die innere Einheitlichkeit des psychologischen Prozesses der geübten heterochromen Photometrierung, die im ersten Teil der Arbeit qualitativ analysierend gegen verschiedene Einwände, insbesondere Sydney Langfeld's verteidigt wird. W. Wirth (Leipzig).

579. Löwi, M., Schwellenuntersuchungen. Theorie und Experiment. *Arch. f. d. ges. Psychol.*, 1924, **48**, 1–73.

Das Schwellenerlebnis ist geknüpft an die *Aussage* der Versuchspersonen. Es liegt also nur vor, sofern es *gewusst* wird. Die übliche Errechnung der Schwellenwerte beachtet dies nicht: Die Ausdrücke "kleiner" und "grösser" u. s. w. bedeuten keine Urteilsausdrücke, da diese im Denken dauerndem Wechsel unterliegen. Die methodische Beziehung von Aussage auf Aufgabe würdigt den Augenblickscharakter des Schwellenerlebnisses: Die Vp. muss *wissen,* einer bestimmten Aufgabe "noch nicht," "nicht mehr" oder "eben gerade" zu genügen. Auch beim *Verfehlen* der Aufgabe besteht Erleben, bestimmbar durch den Begriff "Aufgabenwechsel." Im "Optimalerlebnis" wird der Aufgabe voll genügt. Mit Beziehung hierauf experimentelle Nachweise in notwendiger Verbindung mit theoretischer Analyse. M. Löwi (Breslau).

580. Pauli, R., und Wenzl, A., Uber Farbenempfindungen bei intermittierendem farblosem Lichte. *Arch. f. d. ges. Psychol.*, 1924, **48**, 470–484.

Die Farbenerscheinungen treten an rotiereden Scheiben mit Schwarz-Weisssektoren innerhalb der Flimmerzeiten auf. (Fechner)

Sie wurden einer systematischen Untersuchung unterzogen unter Abänderung folgender Versuchsbedingungen, besonders an der Benhamscheibe: Umdrehungsgeschwindigkeit, Umdrehungsrichtung, Beobachtungsdauer, Beleuchtungsstärke, Netzhautstelle, Beschaffenheit der Schwarzsektoren nach Zahl, Grösse und Gestalt, Scheibendurchmesser. Auch farbige Sektoren (rot, grün besonders, dazu gelb, blau) fanden Verwendung. Hauptergebnisse: Bei wachsender Umdrehungsgeschwindigkeit treten nacheinander 3 verschiedenartige Erscheinungen auf: farbige Ringe, dann gesättigte Blau Gelbsektoren, endlich rote und grüne Flecken, kurz vor der Verschmelzung. Hohe Beleuchtungsstärke und indirektes Sehen heben die Erscheinungen auf. Eine Erklärung lässt sich geben unter Annahme eines resonnanzähnlichten Verhaltens der Erregungsvorgänge, deren Trägheit für die einzelnen Farbqualitäten verschieden zu denken ist. R. PAULI (München).

581. WIRTH, W., Bedeutung und Gültigkeit des Fechner-Helmholtzschen Satzes über negative Nachbilder. *Arch. f. d. ges. Psychol.*, 1924, **46**, 125–187.

Verf. verteidigt sich hier namentlich gegen die Angriffe von Dittler und Orbeli, sowie von C. Hess, auf den vermeintlichen Wirth'schen Versuch, eine genaue Proportionalität des physikalischen Nachbildmasses zur reagierenden Reizintensität zu behaupten. Jene Autoren haben völlig übersehen, dass schon Wirth selbst in seiner Habilitationsschrift (1900) die relative Zunahme des Proportionalitätsfaktors nach unten hin als wesentlich erkannte und mit alten Beobachtungen *Hering's* in Zusammenhang brachte. In neuen Versuchen konnte Wirth jene untere "Hering'sche Abweichung" bei Herabsetzung der Gesamtbeleuchtung auch für das erste Nachbildstadium ca 1/5 sec. nach Aufhebung des ursächlichen Helligkeitskontrastes bestätigen, die er in Übereinstimmung mit C. Bühler's Ergebnissen über Adaptations-Einflüsse (1903) als eine Umstimmungserscheinung betrachtet. Bei Dittler und Hess bestand ferner eine Unklarheit über die physiologische Bedeutung des (genauen) F.–H.schen Satzes, den sie mit der direkten Proportionalität der Sinneserregung E zum Reiz x in eindeutige Verbindung bringen wollten. In Wirklichkeit wäre aber sogar die genaue Gültigkeit, die nach Helmholtz durch die Formel $f_1(x)=f_2(ax)$ ausgedrückt wird, mit den verschiedensten Beziehungen $E=f(x)$, insbesondere, wie schon G. E. Müller erkannte, auch mit der Formel $E=k.\log x+C$, verträglich. W. WIRTH (Leipzig).

582. Goldschmidt, R. H., Grössenschwankungen gestaltfester, urbildverwandter Nachbilder und der Emmert'sche Satz (Mit Bemerkungen zur Logik der experimentaldeskriptiven Psychologie). *Arch. f. d. ges. Psychol.*, 1923, **44**, 51–131.

Nachbilder werden hinsichtlich ihrer Grösse (1) überhaupt, (2) bezüglich des Gestaltproblemes, (3) bezüglich der eidetischen Anschauungsbilder untersucht. Emmerts Satz wird nach Experimentalkritik von literarischem Material definiert, wonach seine Bedeutung für die Eidetikerfrage Bedürfnis erweckt. Es ergibt sich eingeschränkte Gültigkeit für Nachbilder, überhaupt für subjektiv-optische Phänomene. Die Einschränkungen beruhen teilweise auf Diskrepanz zwischen scheinbarem und bulbärem Nachbildabstand. Sie fallen fort, wenn der scheinbare Nachbildabstand in Rechnung gezogen wird. Der so modifizierte Satz bewährt sich auch bei Diskussion eidetischer Anschauungsbilder. R. H. Goldschmidt (Münster).

583. Giessler, G. M., Zur Charakterisierung der phänomenalen Räume, insbesondere des Hörraumes. *Arch. f. d. ges. Psychol.*, 1923, **45**, 282–297.

Verf. unterscheidet primäre phänomenale Räume, den Sehraum und Druckraum, von sekundären phänomenalen, dem Hörraum, Temperaturraum, Riechraum u.s.w., und sucht nachzuweisen, dass die optisch-taktile Raumanschauung Modifikationen erleidet durch Reize anderer Modalitäten, sodass die auf letzteren beruhenden Raumanschauungen jener gegenüber eine gewisse Selbständigkeit erlangen. Als Vergleichsmomente fungieren einerseits die allgemeineren Lageeinstellungen des Körpers auf seine Umgehung und die Gesamtwirkung der jeweiligen Raumerfüllung auf die Beweglichkeit derselben, andererseits die objektive Ausgestaltung, nämlich Entfernung, Ausdehnung, Form und Gestalt und die Beschaffenheit eventueller Grenzflächen. Der Hörraum wird geschildert in seinem schwächeren Eingreifen in den Sehraum durch Schallreflexionen, sodann in seinem umfassenderen Übergreifen, bei heftigen gleichförmigen oder harmonischen Schallen zu gunsten der Ausgestaltung des Sehraumes, bei heftigen ungleichförmigen oder disharmonischen Schallen im Sinne der eigenen Verselbständigung. C. M. Giessler (Erfurt).

584. Poppelreuter, Zur Psychologie und Pathologie der optischen Wahrnehmung. *Zeit. f. d. ges. Neurol. u. Psychol.*, **83**, 26–152.

Die Arbeit geht aus von einer bis ins einzelne durchgeführten Kritik eines Falles von "apperzeptiver Seelenblindheit," welchen Goldstein und Gelb 1920 aus dem Frankfurter Hirnverletzten = Lazarett mitgeteilt haben und an den sie eine Theorie der Seelenblindheit anschlossen. P. bestreitet, dass die periphere Sehfunktionsprüfung in diesem Falle ausreichend exakt durchgeführt sei, um zu differenzieren, "ob das Abnorme des Erlebens in dem zugrunde liegenden Sinnesinhalt oder aber in der Verarbeitung dieses Sinnesinhaltes gelegen ist." Insbesondere legt er grossen Wert auf eine sorgfältige Aufnahme des durch Hirnherde geschädigten *Gesichtsfeldes* mit besonderen Methoden, welche die Übergänge von dem cerebral blinden zu dem ungeschädigten Teil berücksichtigt. Ein zweites Kapitel berichtet über experimentelle Untersuchungen am Normalen bei denen durch entsprechende Vorrichtungen eine weitgehende Einengung des Gesichtsfeldes erzeugt wurde. Dabei ergibt sich, dass alle bei dem Fall von Goldstein und Gelb beschriebenen pathologischen Tatsachen—Leistungen ebenso wie Erlebnisse—sich auch beim Normalen künstlich hervorrufen lassen. P. findet weiterhin die gleichen Störungen bei einem Fall von Erkrankung der Netzhaut und stellt dann allen bisherigen Befunden einen Hirnverletzten gegenüber, bei dem nach seiner Meinung nachweislich agnostische und optisch-apraktische Symptome nachzuweisen sind. P. wendet sich weiterhin gegen die Anwendung der Psychologie der Gestalt auf das vorliegende psychopathologische Problem, wie sie von Goldstein und Gelb vorgenommen wurde. Er unterscheidet sieben Stufen der "Differenzierung" des Sehfeldes und entwickelt schliesslich auf grund dieser Unterscheidungen eine Lehre vom "Stufenabbau und Stufenaufbau des Sehsystems" mit Hilfe der pathologischen Befunde. Die Arbeit, welche sich wie vielfach betont wird, auf ein grosses Material stützt, enthält ausser dem hier in grossen Umrissen wiedergegebenen Gedankengang noch zahlreiche Erörterungen einschlägiger Nebenfragen; insbesondere verdienen die Ausführungen über das Lokalisationsproblem in der optischen Rinde erwähnt zu werden. W. Mayer-Gross (Heidelberg).

585. Danforth, C. H., The Problem of Incidence in Color Blindness. *Amer. Nat.*, 1924, **38**, 447–456.

The available data do not suffice to show conclusively that color blindness is a simple sex-linked trait, although they make it appear probable that such is the case. The number of color-blind females is in excess of expectations based on the theory of sex linkage and random mating. Several hypotheses which might account for this discrepancy are susceptible of adequate testing through the accumulation of critical data. It is suggested that subordinate groups exist, showing differential frequencies of color blindness. If such groups do exist and are of any considerable size, marriages within them might be wholly free from what is ordinarily classed as consanguinity without reducing appreciably the relative number of color-blind females. Other hypotheses are considered. R. H. Wheeler (Oregon).

586. Stewart, G. N., Color Phenomena Caused by Intermittent Stimulation with White Light. *Amer. J. of Physiol.*, 1924, **69**, 337–353.

Presentation and theoretical discussion of the author's experimental finding that white light of a given intensity occasions subjective color sensations, which pass progressively from violet toward red, approximately in the order of the spectral color series, as the rate of intermission is progressively increased; and, moreover, that if the rate of intermission is kept constant while the intensity of the white light is varied, an increase of objective intensity occasions subjective hues tending progressively toward violet and a decrease of objective intensity causes a shift of hue toward the red end of the spectrum. Explanation of the color changes observable in rotating Benham's top is also offered. M. J. Zigler (Wellesley).

587. Amberson, W. R., Secondary Excitation in the Retina. *Amer. J. of Physiol.*, 1924, **69**, 354–370.

A description of two related antopic effects—the " blue arc " and the " blue spike "—and the conditions under which they are observed. These phenomena are also studied in a pathological eye in which a paracentral scotoma lies across the retinal zone in which these phenomena appear; *i.e.*, between the fovea and the optic disc. The writer concludes that these effects are due to " a secondary stimulation of ganglion cells, or occasionally of their fibers, by the external

circuits of rhythmic nervous discharges passing along retinal fibers which originate from ganglion cells on the rod pathways in the region of primary stimulation," indicating that one nerve cell may communicate activity to another other than through a synaptic junction. M. J. Zigler (Wellesley).

588. Maxwell, S. S., and Pilz, G. F., On the Relation of Labyrinthic and Retinal Excitations in the Rabbit. *Amer. J. of Physiol.*, 1924, **70**, 118–121.

The total amount of rotation-nystagmus effect is less when young brown rabbits are rotated in the dark than when rotated in the light. Retinal stimulation is excluded during rotation in the dark; rotation in the light produces both retinal and labyrinthic stimulation, which combine to produce a greater total amount of rotation-nystagmus. A comparison of the rotation-nystagmus produced during the first with that produced during the twentieth period of rotation shows that the amount of reduction during these twenty periods is greater in rotation in the dark than in the light. M. J. Zigler (Wellesley).

4. FEELING AND EMOTION

589. Nissen, T., Die Physiologie und Psychologie der Furcht in der Ilias. *Arch. f. d. ges. Psychol.*, 1924, **46**, 70–97.

Auf einen Überblick über die bisherigen Versuche einer Darstellung der Homerischen Psychologie folgt eine Erörterung der Homerischen Terminologie des Furchtaffektes. Nachdem sodann der Sitz der Furchtaffekte (Zwerchfell, Herz, Brusthöhle, Thymós) behandelt und die Homerische Tierpsychologie herangezogen ist, werden die physiologischen Begleiterscheinungen der Furchtaffekte besprochen: Kälteschauer, Erblassen, Zittern, Zähneklappern, Herzklopfen, Lähmungsgefühl, Starrheit, Unsicherheit des Blickes, Haarausraufen, Aufspringen, Fallenlassen von Gegenständen, Ducken, Flucht; schliesslich noch Seufzen, Weinen und Verstummen. Auffallend ist bei Homer die Stärke der Affektäusserung bei der Furcht für andere. Was das Wesen der Furcht betrifft, so wird sie entweder selbst als Dämon gefasst oder sie erscheint als von den Göttern gewirkt. Zuletzt werden die in der Ilias vorkommenden Ursachen der Furcht (Kampf, Verwundung, Schläge, Bedrohung, Tiere, Naturgewalten) erörtert. T. Nissen.

5. MOTOR PHENOMENA AND ACTION

590. Krestnicoff, Zur lehre von den grundprinzipen der geistigen vorgänge. *Arch. f. d. ges. Psychol.*, 1924, **49**, 1–60.

Der Verfasser weist nach, dass der Sinneswahrnehmungsvorgang gemäss den Prinzipien und Gesetzen des Reflexes zu Stande kommt. Bei der Wahrnehmung bleiben das zentripetale und das zentrifugale "Psychon" (neue Bezeichnung gewisser vermuteter psychophysiologischer Elemente) von einander abgesondert, ebenso wie es bei dem zentripetalen und zentrifugalen Neuron im Reflexe der Fall ist. Die Organempfindungen liegen dem "Ichpsychon" zu Grunde, das den Zentralpunkt für sämtliche Bewusstseinsprozesse bildet. Hieraus folgen Erklärungsmöglichkeiten für den Schlaf- und Traummechanismus, für hypnotische, hysterische, sowie epileptische Dämmerungszustände ferner (bei Störungen des Perzeptivbogens) für den Mechanismus der Halluzinationen, Pseudohalluzinationen, Agnosien, Amnesien u.s.w., sowie bei Störungen der motorischen Wahrnehmung für die Paraphasie, Paragraphie, Apraxie u.s.w. Den Sinneswahrnehmungsvorgang bezeichnet der Verfasser als primäres Psychon, indem er auch die Existenz eines secundären-emotionalen Psychons zulässt, das den Grundgesetzen unterliegt, denen auch das primäre Psychon untergeordnet ist. Krestnikoff (Sofia).

591. Klopfer, B., Das Problem der seelischen Hemmungen. *Arch. f. d. ges. Psychol.*, 1924, **47**, 45–93.

Vorliegende Arbeit versucht, einen Ueberblick über die mannigfachen Formen des Hemmungsproblems in der modernen Psychologie zu geben, und prüft anhand das Hemmungsproblems die verschiedenen Richtungen der modernen Psychologie auf ihren psychologischen Gehalt. Die "Typenreihe" der gebrauchlichsten Hemmungsbegriffe wird nach ihrem psychologischen ürsprung u. Gehalt untersucht. Vier weitere Abschnitte bringen nach den bisherigen experimentalpsychologischen u. psychoanalytischen Ergebnissen einige neue Beiträge zur Phänomenologie u. zur Theorie der seelischen Hemmungen. B. Klopper (Frankfurt).

592. Sterzinger, O., Über den Stand und die Entwickelung von Begabungen während der Gymnasialzeit. *Arch. f. d. ges. Psychol.*, 1924, **49**, 93–178.

Zwei erste (10 bis 11 Lebensjahr) u. achte (18 bis 20 L.J.) Klassen des Realgymnasiums zu Graz zeigten keine Verschiedenheit

der sinnlichen Aufmerksamkeit (Bourdon-Whipple Test), anscheinend wegen Konstanz der Arbeitsrhythmen. Die abstrakten Aufgaben fallen der Oberklasse leichter. Das mechanische Gedächtnis ändert sich wenig, das logische fast nicht. Dagegen steigt das unmittelbare Behalten sinnvoller Worte, etwas auch das freie Wörtersagen. Auffällig wächst die Umstellungsleistung, das technische Verständnis, die Bewegungsgeschwindigkeit und die Druckkrait der Hand. Mit Ausnahme des Technischen und der Druckkraft korrelieren alle Leistungen mit den Zeugnisnoten. O. STERZINGER (Innsbruck).

593. HANDRICK, J., Zusammengesetzte Reaktionen mit Superposition komplexer psychischen Vorgänge. *Arch. f. d. ges. Psychol.*, 1923, 45, 83–143.

Die Verwirklichung eines von *Wundt* selbst erdachten, aber wohl vergeblichen Versuches, um die vielfach angegriffene Subtraktionsmethode für die Abtrennung von Teilzeiten höherer psychischer Vorgänge in irgend einer Form zu retten. Zunächst sollte die Teilzeit für die Subsumtion eines tachistoskopischen Wortes unter eine der drei Kategorieen Substantiv, Adjektiv, Verbum ermittelt werden, indem man die Teilzeit der vorausgehenden Erkennung des Wortes als sinnvoll durch eine erste Handbewegung rechts (links) abgrenzte, auf die vollzogene Subsumtion aber erst mit einer zweiten Bewegung der anderen Hand reagierte. In zwei weiteren Gruppen wurde zuerst auf die Subsumtion, dann auf eine erste Assoziation und endlich zuerst auf eine erste Assoziation und dann auf eine zweite reagiert, wobei stets Erkennung und Subsumtion in der nämlichen Weise vorausgeben sollten. Der Vergleich mit einfachen Erkennungsreaktionen, die ebenso wie die übrigen Versuche systematisch kontrolliert wurden, ergab jedoch bereits bei Hinzufügung einer Subsumtionsreaktion eine Verkürzung der Erkennungsreaktion um ca 10%. Ebenso erschien die Subsumtions-Reaktion bei Hinzufügung der Associationsreaktion und die erste Ass. Reakt. Bei Hinzufügung einer zweiten immer mehr, bis ca 33% im Mittel, verkürzt. (Verf. gibt selbst zu, dass sich hieraus nicht direkt auf die Zeit der Erkennung u.s.w. schliesen lasse, da die Reaktion bei Bereitschaft zu einer zweiten anders, z. B. weniger vorsichtig ausgeführt werden könne, als wenn sie die letzte ist.) Die allgemeine Verzögerung der zweiten Reaktion nach Topciu (Wundt's *Psychol. Stud.*, Bd. 10, S. 156) suchte Verf. bei seinen Berechnungen zu verwerten. W. WIRTH (Leipzig).

594. Forbes, A., Campbell, C. J., and Williams, H. B., Electrical Records of Afferent Impulses from Muscular Receptors. *Amer. J. of Physiol.*, 1924, **69**, 283–303.

Records, secured by a string galvanometer, of the action currents initiated by the so-called proprioceptor system of receptors. M. J. Zigler (Wellesley).

595. Eddy, N. B., The Action of Preparations of the Endocrine Glands upon the Work Done by Skeletal Muscle. *Amer. J. of Physiol.*, 1924, **69**, 432–440.

Perfusion of the frog's gastrocnemius muscle by internal secretions of parathyroid, corpus luteum, anterior pituitary, thyroid, splenic and pancreatic substances, insulin and thyroxin decrease the work done, while perfusion by internal secretions of pineal, suprarenal, thymus and mammary substances, and secretin increase the work done. Ovarian, orchic, and posterior pituitary substances have no material effect on the work done. M. J. Zigler (Wellesley).

596. Tuttle, W. W., The Effect of Adrenalin upon the Patellar Tendon Reflex. *Amer. J. of Physiol.*, 1924, **69**, 446–454.

Three of nine human subjects to whom adrenalin was administered intramuscularly showed marked augmentation of the patellar reflex; the others were unaffected. The three positive cases showed a high sensitivity to adrenalin. It is inferred that adrenalin has a direct stimulating effect upon the sympathetic fibers to the skeletal muscles. M. J. Zigler (Wellesley).

597. Cattell, M., and Stiles, P. G., The Place of Fatigue in Striated Muscle: Evidence for Failure of Excitation Apart from Contraction. *Amer. J. of Physiol.*, 1924, **69**, 645–653.

Experimental work upon the gastrocnemius muscle of the frog brings the authors to the conclusion that muscular fatigue "is not usually due to an exhaustion of the power of contraction, but to a failure of the process of excitation in consequence of some sharply localized change." M. J. Zigler (Wellesley).

598. Hafkesbring, R., and Collet, M. E., Day to Day Variation in Basal Metabolism of Women. *Amer. J. of Physiol.*, 1924, **70**, 73–83.

Observations made upon two subjects daily over a period of four months indicate that basal metabolism is 5 per cent higher in cold

than in hot weather, and is low on the first or second day of menstruation and often throughout the period. Pulse rate shows no correlation either with temperature or with menstruation. M. J. Zigler (Wellesley).

599. Barlow, O. W., Adrenalectomy and Its Relation to the Metabolism of the Cat. *Amer. J. of Physiol.*, 1924, **70**, 453–464.

Experiments showing the effect of single and double adrenalectomy upon body weight, blood sugar, anal temperature, and oxygen consumption. M. J. Zigler (Wellesley).

6. ATTENTION, MEMORY AND THOUGHT

600. Pauli, R., Ein verbesserter Gedächtnisapparat. *Arch. f. d. ges. Psychol.*, 1924, **49**, 89–92.

Der bekannte Lipmann-Marxsche Gedächtnisapparat ist ausgestaltet worden: Durch eine Schleifenvorrichtung können Reihen bis zu 60 Glieder benutzt werden, während bisher 20 das Höchstmass war. Eine Blendenscheibe, die mit messbar zu verstellenden Sektoren hinter dem Darbietungsspalt rotiert, erlaubt die Herstellung ganz kurzer Expositionszeiten (0.1 Sek. und weniger), verdeckt den störenden Ruck in senkrechter Richtung und ermöglicht rhythmische Darbietungsform, welch letztere auch durch Abänderung der Anschlagstifte gewährleistet wird. Die angeführten Abänderungen, die durch Abbildungen veranschaulicht sind, ermöglichen eine vielseitige Verwendbarkeit des Apparates, ohne dessen Volumen zu vergrössern oder seine Handlichkeit zu vermindern. Ausführung: Institutsmechaniker Mahler, München, Adalbertstr. 3. R. Pauli (München).

601. Meints, C., Die Anschauungen Meumanns über das zustimmende Urteil als Faktor der Willenshandlung. *Arch. f. d. ges. Psychol.*, 1923, **45**, 350–371.

Die tiefdringende Untersuchung der intellektuellen Teilvorgänge des Willens sei das besondere Verdienst der Meumann'schen Willenstheorie. Seine Auffassung, dass die specifische Eigenart der Willensvorgänge nicht auf begleitenden Tätigkeitsgefühlen (Wundt) beruhe, sondern auf der besonderen Struktur ihrer intellektuellen Bestand-

teile, sucht Verf. als richtig zu erweisen. Dagegen habe M. die Bedeutung der Gefühle für den Willen, insbesondere ihren Einflüss auf das zustimmende Urteil, zu gering eingeschätzt. Das letzterer ist nicht ein rein intellektueller Vorgang, wie M. annimmt, sondern ein komplexes Gebilde, dasimmer gefühlsbedingt ist. Diese Einseitigkeit der Willenstheorie M.s ist bedingt durch seine ethische Grundanschauung, deren Einfluss auf seine Untersuchung des Willensproblemes insbesondere auch in seiner Begriffsbestimmung des Willens nachgewiesen wird. C. Meints (Bonn).

602. Petermann, B., Bechterew's Theorie der Konzentrierung. Eine kritische Studie als Beitrag zur Analyse der Aufmerksamkeitsproblems. *Arch. f. d. ges. Psychol.*, 1924, **48**, 82–99.

Der Begriff des Aufmerksamkeitsreflexes ist für B.s Psychoreflexologie von zentraler Bedeutung. Die Studie will nachweisen, das Bechterews Begriff zu eng ist, das er aus dem Associationsprincip nicht abgeleitet werden kann, sondern vielmehr—wie das Assoziationsprincip selbst—nur unter Bezugnahme auf die Tatsache des seelischen Lebens (der subjektiven Psychologie), von denen Bechterew nur scheinbar absieht, ausreichend bestimmt werden kann. B. Petermann (Kiel).

603. Trouet, S., Der Willensakt bei Wahlhandlungen. Eine experimentelle Untersuchung. *Arch. f. d. ges. Psychol.*, 1923, **45**, 157–202.

Von der bekannteren Form der Willenshandlungen, deren Motivation, Wahl und Entscheidung sich auf vorwiegend intellektuelle Tatbestände gründet, ist eine zweite Art zu unterscheiden: emotionale Willenshandlungen. Bei diesen spielen intellectuelle Tatbestände eine geringe, oft minimale Rolle, Gefühle und Stimmungen, die motivierenden Charakter tragen, können so stark werden, dass eine Wahl und Entscheidung überflüssig gemacht wird und an deren Stelle als Ersatzfunktion ein Wechselspiel von Gefühlen tritt, sodass nur die Handlung als Ganzes eine Stellungnahme zu den Gegebenheiten kundgibt, sofern nicht das Ichbewusstsein (im ethischen Sinne) diese Gesetzmässigkeiten durchkreuzt. Die emotionalen Willenshandlungen weisen eine geringere Anzahl von einzelnen Phasen auf, sind also sozusagen mehr aus einem Guss. S. Trouet (Bonn).

604. Meuer, H., Experimentelle Beiträge zur Lehre vom Wortgedächtnis nach der Methode der Polyeidoskopie. *Arch. f. d. ges. Psychol.*, 1924, **47**, 14–44.

Eine akustische Paralleluntersuchung zu der Arbeit Nikolais am nämlichen Institut mit optischem Material (dass Arch. Bd. 42, 1 u. 2 H.). Eine Reihe von einsilbigen Worten wurde vorgelesen und unter verschiedenen Bedingungen reproduziert. Verf. prüfte vor allem Kinder, aber mit Vergleichsversuchen an Erwachsenen, auf den Einfluss der Zahl der Worte, der Ermüdung, der Pausen, weiterer Wiederholungen und namentlich der *Zwischenzeit* bis zur zweiten Reproduktion nach einer ersten sofortigen. Bei 6 Reihen aus je 30 Worten mit verschieden langen Zeiträumen bis zur zweiten Reproduktion ergab sich z. B. als Mittel der Reproduktion bei

	sofort	30″	60″	5 h.	24 h.	4 T.	4 W.
11- bis 12-jährigen Kindern.....	6,8	4,2	3,2	3,3	3,3	2,5	1,4
15- bis 55-jährigen Erwachsenen.	6,8	4,3	4,1	3,6	3,8	2,4	2,7

W. Wirth (Leipzig).

605. Crosland, H. R., An Investigation of Proofreaders' Illusions. *Univ. of Oregon Pub.*, 1924, **2**, No. 6, p. 168.

Report of an intensive study of the proofreaders' illusions. Thirty subjects took part in the investigation and these varied in experience from the professional proofreader to students who were totally inexperienced. Familiar and unfamiliar material was used and the subjects worked under several different instructions at different times which emphasized speed or accuracy. From a statistical study of the results, the author makes the following conclusions, which, it will be noticed, have a practical as well as a theoretical value: 1. No person, even the most experienced, succeeded in reading proof with 100 per cent score for accuracy. 2. The readers, ranked from most accurate in a descending order, do not change positions greatly from series to series. 3. The general order from accuracy is Journalists, Typographers, Psychology Teachers, Journalism Students and Psychology Students. 4. Trained readers excelled untrained readers in the degree of accuracy attained, while the untrained excelled the trained in speed. 5. Accuracy instructions reduced the speed of reading very greatly and increased accuracy by a smaller degree; speed instructions increased the speed of reading very greatly and reduced accuracy by a smaller degree. Practiced readers excelled unpracticed readers in the matter of accuracy most under accuracy instructions and least

under speed instructions. 6. The proofreader errs more on a sheet containing few errors, relatively, than on a sheet containing a great many errors. 7. A negative correlation exists between the amount of time expended in reading and the score of inaccuracy earned. 8. The types of errors most frequently missed are indicated. 9. The proofreader tends to err most frequently on the extreme right-hand side of the page and in the bottom half of the page. 10. Rereading immediately is not profitable. 11. Familiarity of material and of technical terms did not lead to greater or less inaccuracy. 12. The results do not reveal evidence of learning which would give a curve approximating the typical learning curve. These results lead the author to believe that it would be possible to pick out persons who show skill or give promise of becoming skillful in the reading of proof. S. W. FERNBERGER (Pennsylvania).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

606. McGRATH, M. C., A Study of the Moral Development of Children. *Psychol. Mono.*, 1923, **32**, No. 2, pp. 161.

This volume, No. 7 of the Catholic University of America Studies in Psychology, is an account of the findings from a moral judgment questionnaire answered by about 4,000 individuals, ranging in age from six to eighteen and above. The tables give results by age and sex, and distinguish between children in various public school systems and children in Catholic (parochial) schools. The questionnaire presented numerous ethical problems in the form of stories, pictures, and direct questions. Written answers were required from the fifth grade up, the questionnaire being given like a group mental test. In lower grades individual oral questioning was resorted to. The questionnaire required about two hours to answer.

A wide range of ethical situations were presented. The reactions of different ages and groups are clearly presented in the text and over one hundred tables. The bearing of religious instruction on certain problems of conduct (*e.g.*, divorce, church attendance) is indicated. As measured by ability to give socially approved reactions to ethical problems, children grow in moral consciousness gradually, and without sudden acceleration at or just before adolescence, it is found. The gradual nature of moral development and its close dependence on general intellectual development are in fact strikingly shown in this study. Some of Dr. McGrath's "tests" might per-

haps be used in the Binet series, on the basis of her data as to percentages of "passes" at successive ages.

At least one of the tests indicates that the author is not in close touch with real life. It reads, "In most of our large cities there are theaters known as 'Burlesque Shows.' The main performances are open to men only. What is your opinion of this restriction?" Some of the pictures which Dr. McGrath asked children to interpret are enigmatic even to adults because of poor draughtsmanship. The inclusion of questions based on religious instruction (*e.g.*, "Why were you made?"), without differentiation of these from non-religious questions, is probably not desirable; it indicates certain results of such training but nothing regarding moral growth.

The author believes that her results indicate clearly the moral problems to which children are most keenly alive at various ages, and that the proper time for instruction in each special moral problem may be fixed thereby. However, Dr. McGrath's application of her results in a one-page outline for a course in moral instruction seems too far removed and abstracted from the life situations with which her tests deal to be of much service. Who will construct a moral conduct curriculum by the scientific methods which Bobbitt, Charters, and others are developing? This is a vital need, and studies such as Dr. McGrath's, although valuable in other ways, cannot take the place of a direct approach to the curriculum problem.

The author's position with regard to moral training is sound: "The morality of the young child assumes the concrete form of habits: abstract principles are still beyond its grasp. . . . This training (moral) must go on at all times and places to be effective. . . . The direct method should also be used. . . . The earnestness displayed by the children in writing the paper which formed the basis of this study reveals the interest they have in the vital things of life. . . . It is the inalienable right of every child to be trained to social conduct before he has the chance to err. Moral education should be primarily formative, not corrective." L. A. PECHSTEIN (University of Cincinnati).

607. WALLIS, W. D., Mental Patterns in Relation to Culture. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 179–185.

A pattern psychology would fill a great need of social psychology in providing a behavior pattern of the group with its related action and reaction, demonstrating that the psychology of the group is not a

total of the psychology of individuals composing the group. Mental patterns are found in every culture area which reflect the various phases of culture in a type of mind. Down through the history of civilization have come the story of change in mental patterns. To-day our modern social order reflects class or culture in mental patterns. Granting the existence of these patterns, however, no knowledge of separate parts of an individual mind is adequate without an understanding of the whole integrated mental pattern. The parts are interconnected and interdependent, and accordingly any change in one part reflects a corresponding change in the whole pattern. " No analytical knowledge of parts which are summed up will give the mental pattern, and without the pattern the psychologist will not be able to understand the part, for its significance depends upon its place in the complex. Such a pattern psychology of both individual and group will tell us more about the fundamental type of behavior than will any analytical study of the atomistic sort." E. F. Symmes (Boston Psychopathic Hospital).

608. Gault, R. H., Progress in Experiments on Tactual Interpretation of Oral Speech. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 155–160.

A very interesting report of the progress made in interpreting oral speech by tactual impressions. The writer, despite the difficulty in learning the quality of separate stimulations and the emerging of the tactual correlates of phonetic elements, is satisfied that it is possible to learn oral speech interpretation in this way. E. F. Symmes (Boston Psychopathic Hospital).

609. Eldridge, S., Instinct, Habit, and Intelligence in Social Life. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 142–154.

A discussion of the nature of instinct and its relatoin to habit and intelligence in social life. The writer examines and criticizes the position taken by various schools of psychology: first, the cultural theory of mental traits, wherein specific inborn tendencies are minimized or denied; second, the structural theory in which behavior is interpreted in terms of neural structure and functions; third, the instinct theory which lays less stress on intellectual and environmental factors and emphasizes innateness of specific instincts as primary determinants of human behavior in every stage of development. The conclusions drawn are developed by a fourth theory

termed "the middle of the road position," already taken by many psychologists, who "concede the reality of instinctive impulses and their importance for behavior, but insist also on the importance of habit, culture, and environmental factors generally." Even within this liberal interpretation there are vital differences as to the possibilities of socializing habit and instinct and utilizing them as functions through education. E. F. Symmes (Boston Psychopathic Hospital).

610. Runge, K., Die Verletzung der persönlichen Freiheit, insbesondere auf psychologischem Wege. *Arch. f. d. ges. Psychol.*, 1924, **49**, 245–282.

Ein Abschnitt aus der Inauguraldissertation des Verfassers über die persönliche Freiheit, ein Grundrecht der Reichsverfassung als Objekt strafrechtlichen Schutzes im geltenden und künftigen Reichsstrafrecht (Leipzig 1922 nicht veröffentlicht). Aus den Verletzungsmöglichkeiten durch physische und psychologische Einwirkungen werden Folgerungen für die Ausgestaltung und die Grenzen des Freiheitsschutzes, durch die staatliche Strafrechtsordnung abgeleitet. Nach dem Zustandekommen der "Willenshandlung" werden die unter dem Oberbegriff des Zwanges zusammenzufassenden Mittel betrachtet und auf ihre Eignung zu deliktischen Eingriffsmöglichkeiten in die Freiheit der Willens*entschliessung* oder die Freiheit der Willens*betätigung* geprüft. Als wesentliche Unterarten dieses Zwanges kommen in Betracht: Gewalt, Drohung und List, wozu noch Betäubung, Suggestion und Hypnose treten. K. Runge.

611. Kupky, O., Die religiöse Entwickelung von Jugendlichen, dargestellt auf grund ihrer literarischen Erzeugnisse. *Arch. f. d. ges. Psychol.*, 1924, **49**, 1–88.

Das Kind hat noch keine Religion im prägnanten Sinne. Erst der Jugendliche entdeckt von sich aus, "spontan," den eigentlichen Sinn der religiosen Werte. Schon im ersten religiösen Eindruck am Beginn der Pubertätszeit ist die Religion "ganz" enthalten, voll entfaltet ist sie erst am Ende dieser Zeit. Nur in seltenen Fällen verläuft die Entwickelung kontinuierlich. Im Gegensatz zu gewissen Sekten begünstigen die Kirchen den kontinuierlichen Verlauf, doch auch kirchlichen Jugendlichen bleiben innere Kämpfe nicht erspart. Die Tagebücher zeigen, dass nach dem ersten religiösen Eindruck das in der Kindheit aufgenommene Glaubensgut überprüft wird. Zweifel stellen sich ein, die durch neue religiöse Erlebnisse immer wieder

überwunden werden. Mit der Bildung einer eigenen religiösen Überzeugung erreicht die Entwickelung einen gewissen Abschluss. O. Kupky (Leipzig).

612. Pappenheim, M., Kritische Untersuchungen zum Rasengang (ganga undir jartarmen) der Isländersagas. *Arch. f. d. ges. Psychol.*, 1924, **46**, 97–124.

Die künstliche Begründung des Bruderschaftsverhältnisses erfolgt nach den Isländersagas in der Art, dass die sich Verbrüdernden unter einen aus der Erde ausgeschnittenen, mit den Enden festhaftenden Rasenstreifen treten, ihr Blut zur Erde träufeln lassen und mit ihr vermischen und einander die Übung der Blutrache eidlich geloben. Gegen eine mehrfach vertretene Ansicht ist daran festzuhalten, das der Rasengang nicht ein Ritus der Eidesbestärkung ist, sondern zur Blutmischung gehört und mit ihr die Verbrüderung der zusammen im Mutterleibe Verweilenden versinnbildlicht. Anscheinend ist der merkwürdige Brauch an die Stelle eines älteren, nicht mehr verstandenen Fussspurzaubers getreten, dessen Verbrüderungswirkung durch das Träufelnlassen von Blut in die Fussspur eines anderen herbeigeführt wurde. Dass diesem älteren Brauche auch bei den Germanen einstmals ein Bluttrinken voraufgegangen ist, kann höchstens vermutet werden. M. Pappenheim (Kiel).

613. Honecker, M., Komik und Einstellung. Ein Beitrag zur Lehre von den Bedingungen des komischen Erlebnisses. *Arch. f. d. ges. Psychol.*, 1924, **47**, 94–107.

Die Theorie von Theodor Lipps sei nicht im stande, alle Fälle von Komik aufzuklären. Man müsse vielmehr den Begriff der "Einstellung" zu Hilfe nehmen, d. h. "die durch das Erscheinende selbst oder durch die vorausnehmende Erwartung bedingten Meinungen bezüglich der weiterhin erlebbaren Beschaffenheiten des Gegebenen oder Kommenden." Nach dieser Theorie ergibt sich ein komischer Eindruck dann, "wenn ein (nicht interessebetonter) Gegenstand aus einer Einstellung, die aus antecipierender Erwartung oder aktueller Auffassung entsteht, in einer für den Sinn des Gegenstandes bedeutungsvollen Weise herausfällt, so freilich, dass durch dieses Herausfallen keine wichtigen Interessen des Erlebenden gestört werden." Die Theorie wird an einzelnen Arten der Komik und besonders am Witz dargelegt. M. Honecker (Bonn).

8. SPECIAL MENTAL CONDITIONS

614. HULL, C. L., The Influence of Tobacco Smoking on Mental and Motor Efficiency. *Psychol. Mono.*, 1924, **33**, No. 3.

This high grade experimental study from the Wisconsin laboratory reports a most thorough investigation made for the American Committee for the Study of the Tobacco Problem. This study is an outstanding contribution primarily because of Dr. Hull's success in devising a neutral control dose which could not be distinguished by the subject from the actual tobacco. Nineteen subjects were used, and twelve physiological and psychological functions were measured. Pipe smoking was the form investigated. Nine of the subjects were occasional smokers or total abstainers, but with a tolerance for tobacco. Ten of the subjects were habitual and heavy smokers. The effects of smoking were traced for the first hour and one-half after the termination of the smoking.

With habitual smokers, only three of the twelve forms of behavior investigated revealed an unmistakable influence of smoking. These are pulse, hand tremor (essentially physiological processes), and mental addition. The heart rate is stimulated, and hand tremor is increased. Addition shows a favorable effect where the subject is an adult and accustomed to the use of tobacco. On the other hand, rote learning and memory span probably are unfavorably affected by tobacco. Hull calls attention to the fact that in the first case old associative bonds are functioning, and in the second case new associative bonds are being formed. The other functions tested are rate of voluntary movements, muscular fatigue, rate and accuracy of discriminatory eye-hand reactions, rate of eye-voice reactions, based on old and on new associative bonds, and rate of learning nonsense material.

This monograph is ably written and is replete with illustrations, tables, and graphs. It includes an excellent summary of earlier investigations, together with many of their significant statistical findings. All in all, this is the foremost investigation in its field to date. L. A. PECHSTEIN (University of Cincinnati).

615. MORGAN, J. J. B., Hypnosis with Direct Psychoanalytic Statement and Suggestion in the Treatment of a Psychoneurotic of Low Intelligence. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 160–165.

Inasmuch as it has been shown that normal intelligence is required in order to conduct a psychoanalysis, the procedure of treating a psy-

choneurotic of low intelligence by hypnosis was determined upon in one very successful case. This treatment is not recommended for ordinary cases, but the writer felt it justified on the grounds that a person with a low intelligence "must have a boss" and his conduct is the result of authority imposed upon him. "If the authority has led to an improper emphasis concerning life's ideals and adjustments then surely the superimposition of greater authority so as to readjust these ideals is more sensible than trying to use a method of reasoning." E. F. Symmes (Boston Psychopathic Hospital).

616. Sherman, M., Hallucinations in Children. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 165–171.

A rather unusual study was made of early developing schizophrenia in children, where the hallucinations appeared some time after the recognition by observers of mental difficulty. These hallucinations showed development through fairly definite stages: first, a state of conflict, then expression of this in vague images, recognized by the subject as pathological or unexplainable, and finally perfected images regarded as true perceptions and of real existence with accompanying indifference. The presence of the hallucinations appeared to offer means of relief either through justification of patient's behavior or a satisfaction of his wishes. E. F. Symmes (Boston Psychopathic Hospital).

617. Willey, M. M., The Psychic Utility of Sleep. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, **19**, 174–179.

Sleep as purely physiological in value is challenged in this article, which attempts to prove the psychic utility of sleep as an escape mechanism. The case studies cited range from a striking example of sleep as one child's device of escape from facing the violation of the moral code to the ordinary experiences of daily life where an unpleasant task leads to a desire of escape, followed by apathetic sensations which are antecedent to sleep. The writer even feels that "it is not at all improbable that the roots of the expression, 'You make me tired!' are in the desire to withdraw from the company of individuals whose conversation or personalities are conducive to boredom or irritation. The sequence is: boredom, the desire to escape, the unconscious urge to sleep, the expression of tiredness. The universal acceptance of this expression as a rebuke to individuals whose presence or conversation is consciously or unconsciously

annoying, testifies to the adequacy of this analysis." E. F. SYMMES (Boston Psychopathic Hospital).

618. ALLPORT, G. W., The Study of the Undivided Personality. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 132–142.

The analytic method employed thus far by investigators measuring personality traits is fallible because of the fact that the traits thus measured are isolated rather than combined into an integrated, undivided personality. "The *way* in which traits are joined together is as much a part of the personality as are the traits themselves. This form of combination, or form-quality, is irretrievably lost in any scheme for the analysis of personality. The form-quality being as it is an attribute of the entire integrated personality, is manifest in every act of the individual (so long as it is not a "dissociated act"); but certain behavior and certain products of behavior are more accessible to investigation than others. In practical life we gain a knowledge of personality without conscious reference to any of the signs by which the perception is mediated. A really thoroughgoing comprehension of personality entails a sympathetic understanding of the individual's driving interests and sentiments, and of the way in which these interests and sentiments are organized and are expressed in his habitual adjustments to the major problems of life. This understanding is gained through a kind of "empathy," the genetic nature of which is not entirely clear, but which undoubtedly enables us to experience sympathetically the form-quality in the personality of an associate, without obscuring our apprehension of his total personality by an undue emphasis upon single traits." E. F. SYMMES (Boston Psychopathic Hospital).

619. ANON., Two Interesting Dreams. *J. Abnorm. Psychol. and Soc. Psychol.*, 1924, 19, 171–174.

A problem is presented for the interpretation of two dreams, which the writer, a psychologist in general disagreement with the psychoanalytic school, comments upon as fitting into Freudian formulations except for one striking fact, that the "censorship" was much more relaxed in the near day-dream state of the second dream while the first occurred during profound slumber. E. F. SYMMES (Boston Psychopathic Hospital).

620. Luckhardt, A. B., and Johnston, R. L., The Psychic Secretion of Gastric Juice under Hypnosis. *Amer. J. of Physiol.*, 1924, **70**, 174–182.

In tests made upon a single subject ten minutes before and fifteen minutes after a test meal or the suggestion of a meal, it is found that gastric secretion is more prompt when the subject is under hypnosis than when in the normal state. The acidity of the gastric secretion is equally high and the quantity equally as copious when a test meal is merely suggested to the hypnotic subject as when the meal is actually ingested. The general conclusion of the study is that hypnotic sleep results in temporary removal of central inhibition from the gastric secretory mechanism. M. J. Zigler (Wellesley).

621. Johnston, R. L., and Washeim, H., Gastric Secretion in Sleep. *Amer. J. of Physiol.*, 1924, **70**, 247–253.

During preparation for sleep the acidity of gastric secretion shows a rise which continues for an hour or more after the onset of sleep, and reaches its maximum generally about the time that sleep is deepest. If the Ewald test meal is taken just before retiring sleep produces a considerable delay of emptying of the stomach, a marked rise in acidity, and a delay in the fall of gastric acidity. If no food is taken gastric acidity approaches that of the resting state in the course of two or three hours after the onset of sleep. M. J. Zigler (Wellesley).

9. NERVOUS AND MENTAL DISORDERS

622. Barker, L. F., The Significance of Certain Factors for the Development of the Heredofamilial Diseases of the Nervous System. *Arch. of Neurol. and Psychiat.*, 1924, **3**, 294–299.

A study in heredity dealing with consanguinity, race, endocrinopathies, toxins, infections, alcoholism, and Roentgen rays. W. P. McElroy (Boston Psychopathic Hospital).

623. Lloyd, J. H., and Grant, F. C., Tumor of the Hypophysis. *Arch. of Neurol. and Psychiat.*, 1924, **3**, 277–287.

Report of a case. W. P. McElroy (Boston Psychopathic Hospital).

10. INDIVIDUAL, RACIAL, AND SOCIAL PSYCHOLOGY

624. WHITEN, E. S., Self-Supporting Prisons. *J. Crim. Law and Crim.*, 1924, **15**, 323–328.

A report on a program which provides for the selling and purchasing of prison-made goods among the prison systems of the states through the Association of Government Service. Such a program would make it possible for the prisons to be self-supporting and beneficial to the prisoners, without being inimical to the best interests of industries throughout the country. F. KNAPP (Boston Psychopathic Hospital).

625. WARNER, S. B., and BATES, S., Information Concerning Adult Male Criminals Which Should Be Published by Reformatories, Penitentiaries, and State Prisons. *J. Crim. Law and Crim.*, 1924, **15**, 177–238.

Uniform methods of obtaining and recording statistics in reformatories, penitentiaries, and state prisons are needed for adequate knowledge of how criminal justice is being administered in this country as a whole. This report deals with the minimum amount of information which should be published by institutions as to prisoners. It includes twenty-six tables, each followed by a "short statement of the reasons why the particular table is important; the basis of the table, whether total prison population, admissions, or discharges; the method of obtaining the information, and instructions for making up the table." F. KNAPP (Boston Psychopathic Hospital).

626. MURCHISON, C., American White Criminal Intelligence. *J. Crim. Law and Crim.*, 1924, **15**, 239–316.

"In 1915 the classic writers on the subject were agreed that criminals are largely mentally defective." This opinion "was certainly not built upon a solid foundation of collected facts." Data are given to show that the "criminal element of society . . . does not possess a lower average intelligence than the adult civil population." The author does not hold the conviction that criminals have more able minds than do the more conservative members of society. But he is convinced that great harm has been done by the propaganda which creates the impression that the criminal is feebleminded. The problem of criminal intelligence cannot be discussed adequately with-

out due reference to geographical concomitants. The data obtained about white native-born men from training camps and prisons are presented in full at the end of the article. F. KNAPP (Boston Psychopathic Hospital).

627. SPECTOR, T., Some Fundamental Concepts of Hebrew Criminal Jurisprudence. *J. Crim. Law and Crim.*, 1924, 15, 317–328.

While there is no sovereign authority to enforce obedience to the Jewish law, it still receives homage from the bulk of the Jewish race. It is based on the Bible, especially the Five Books of Moses. The Christian world stigmatizes the Talmudic system as cruel, without good reason, for no other nation has such ample safeguards for the accused and the death penalties are more humane than most people realize. Illustrations are given of the rigid investigations before a man may be sentenced to death and of the way suffering is lessened in executing the penalty. F. KNAPP (Boston Psychopathic Hospital).

628. OLSON, H., CUMMINGS, H., and WIGMORE, J. H., The Loeb-Leopold Murder of Franks in Chicago, May 21, 1924. *J. Crim. Law and Crim.*, 1924, 15, 347–405.

A record of the case, divided into six parts and preceded by editorial comments. (A) Brief chronology of events from May 21 to September 10. (B) The events of the crime and its detection; a summary from a memorandum of the state's attorney. (C) The opinion of the experts for the defense, given in a joint summary report by Wm. A. White, Wm. J. Healy, Bernard Glueck, and Ralph Hamill. Leopold's phantasy life, defective judgment, repression of emotional life, abnormal urge towards activity and search of new sensations led to the conclusion that he represented a paranoid psychopathic personality. Loeb manifested a pathological divergence between his intellectual and emotional life; the latter being decidedly infantile. (D) The opinions of the experts called by the prosecution (H. T. Patrick, H. D. Singer, A. Church, and W. O. Krohn); excerpts from their answers in testifying. All agreed that there was no evidence of mental disease, functional or organic, and said that the phantasies described were not abnormal, and that there was evidence of definite emotional reactions. There was, however, evidence of a slowly growing criminal character. (E) The sentence of the judge, John R. Caverly. As the psychiatrist's findings were

deserving of legislative rather than judicial consideration, the court states that he ignored this material and was moved chiefly by the consideration of the age of the defendants. Also he feels that "life imprisonment . . . may well be the severer form of retribution and expiation." (F) Comments on the sentence from the legal profession, made by H. Olson, H. Cummings, and J. H. Wigmore. Mr. Olson felt that the prosecution should not have ignored the emotional defects of the defendants, that the only sound ground for failing to hang them was that they were emotional defectives, and that the psychiatrists were at fault in omitting the hereditary background and in making use of artifices that beclouded real issues. Mr. Cummings held that the penalty was quite properly fixed without reference to the reports of the psychiatrists, but that the delay was unfortunate. Mr. Wigmore concludes the article with comments on the judge's decision and on the reports of the psychiatrists for the defense. In the judge's sentence there were some apparently illogical statements, but the cardinal error was the ignoring the deterrence theory as the basis of criminal law. "The theories of the basis of penal law are reducible to four—Retribution, Reformation, Deterrence, and Prevention." Prevention is the concern of social measures rather than of the courts; retribution has long been discarded, and reformation is improbable in this case. Thus deterrence was the important consideration. Since the decision overlooking this, cases have been noted that show clearly that the remission of the extreme penalty here has already lessened the restraint on the outside class of potential homicides. The psychiatrists for the defense overlooked the fact that the modern penal law is not based on moral blame but on social self-defense. The fact that a crime is the natural and inevitable result of an individual's character does not justify legal indulgence, for such would offer impunity to the more dangerous criminals. Mr. Wigmore considers that it is time the public learn to discard false sympathy which is apt to arise on the first acceptance of the biopsychologic doctrine of determinism. F. KNAPP (Boston Psychopathic Hospital).

629. CUMMINGS, H. S., The State vs. Harold Israel. *J. Crim. Law and Crim.*, 1924, 15, 406–434.

In the statement made to the Superior Court for Fairfield County, Connecticut, Mr. Cummings, state's attorney, gives the reasons for his entering a nolle of a charge of a first degree murder in the case

of Harold Israel, accused of the murder of Father Dahme in Bridgeport on February 4, 1924. Feeling that "it is just as important for a state's attorney to use the great power of his office to protect the innocent as to convict the guilty," Mr. Cummings spent much time and effort investigating the apparently incriminating facts cited by the coroner. He tells in detail his methods and demonstrates clearly how the conclusion was reached that Israel was innocent. F. KNAPP (Boston Psychopathic Hospital).

630. MURCHISON, C., American White Criminal Intelligence. *J. Crim. Law and Crim.*, 1924, **15**, 435–494.

This concludes the study begun in the last number. More data are given. In the summary the author says that in terms of Alpha scores the criminal group is superior to the white draft; criminals classified by types of crimes differ greatly in intelligence; recidivists tend to be more intelligent than first offenders; the criminal is less literate than was the American Army; the criminal group is relatively youthful; the criminal is religious; more criminals are single than married; there seems to be no significant seasonal distribution of criminal intelligence; and the length of incarceration does not decrease the ability to make a high score on the Alpha tests. F. KNAPP (Boston Psychopathic Hospital).

11. MENTAL DEVELOPMENT IN MAN

631. GUTMANN, M. J., Über Augenbewegungen der Neugeborenen und ihre theoretische Bedeutung. *Arch. f. d. ges. Psychol.*, 1924, **47**.

Es gibt lichtscheue, indifferente und lichtfrohe Neugeborene. Das Zukneifen der Augen erfolgt *sofort* nach der Geburt (nicht erst am 10 Tage nach Preyer). Die Verengerung der weiten Pupille erfolgt von Geburt an reflektorisch. Einige Neugeborene vermögen bereits in den ersten Tagen (das jüngste Kind war 2 Tage 5 Stunden alt) ein helles Objekt (Lampe) zu fixieren und ihre Augenmuskeln *koordiniert* zu gebrauchen, andere erst später. Es handelt sich um ein "Erlernen" des sicheren Gebrauchs der Augenmuskeln analog den übrigen Körpermuskeln. Die koordinierte Bewegungsmöglichkeit ist zu einem Zeitpunkt erreicht (4 Monate), in dem nach Flechsig's Untersuchungen der Markbildungsprozess an den gröberen Faserzügen des Gehirns als abgeschlossen betrachtet werden kann.

Bei weiblichen Früchten ist die Entwicklung vielfach weiter entwickelt als bei männlichen: Auch bei diesen Versuchen gaben die Mädchen die weitaus häufigeren positiven Befunde. M. J. GUTMANN.

632. MERRIMAN, C., The Intellectual Resemblance of Twins. *Psychol. Mono.*, 1924, **33**, No. 5.

Three questions are raised and answered by this study: "(1) What is the effect of environment upon the amount of intellectual resemblance of twins? (2) Does the fact of twin origin and birth operate in any way to lower the intellectual level of a twin population? (3) What light do the psychological data throw upon the current biological belief that there are two distinct types of twins, fraternal and duplicate?" The first two questions are answered in harmony with the earlier findings of Thorndike, the third in disagreement with Thorndike. The data presented are superior to those of Thorndike in the number of cases studied (upwards of 200 pairs of twins in the present study), and in the type of mental tests employed (Stanford-Binet, Beta, N. I. T.).

(1) Environment is found to make no significant difference in the amount of twin resemblance. (2) Twins suffer no intellectual handicap, the mean and median I.Q. being practically the same as for the general population, the sexes failing to show significant differences in variability, etc. (3) The data show quite conclusively, according to the author, that there are two distinct types of twins. In support of this last conclusion, the following evidence is adduced: "In every case where like-sex pairs are compared with unlike-sex pairs, the correlation of the like-sex pairs is significantly higher. . . . When sibling data are compared with twin data, the correlations lie much nearer the unlike-sex pair twin data than to the like-sex pair data. . . . All the curves and curve fitting tests used in the study indicate clearly a difference between like- and unlike-sex pair twins. . . . The empirical study of verbal reports on 'similar pairs' tends strongly to show that curve differences are to be largely accounted for by the like-sex pairs that show great intellectual and physical similarity, and that presumably belong to the duplicate type." In spite of the author's inability "to devise any method of studying the curves or the scores that will certainly point out the duplicate pairs," this evidence seems convincing, when interpreted in the light of the usual biological assertion, that duplicate twins are always of the same sex, while fraternal twins may or may not be of the same sex. L. A. PECHSTEIN (University of Cincinnati).

633. Stinchfield, S. M., The Formulation and Standardization of a Series of Graded Speech Tests. *Psychol. Mono.*, 1923, 33, No. 2.

Herein is reported the successful completion of a long series of studies by the author on the subject of speech difficulties. Graded objective tests for children and adults, which correlate highly with a subjective speech rating, have been developed and tentatively standardized on 427 cases. The seven tests chosen consist of two articulation tests, and tests of rate in spontaneous speech, rate in oral reading, rate in silent reading, percentage of relevant words used in spontaneous speech, and vocabulary. The sentences used in the articulation tests were prepared in accordance with the standards set by the International Phonetic Association. After weighting each test to its optimum value, the team of tests gave a multiple correlation of .731 with the subjective rating, this being regarded by the author as unusually high. For diagnostic purposes the entire team of tests should be used, but the articulation tests alone have decided value as a short form. This research brings the study of speech defects definitely into line with the measurement movement, and furnishes a splendid diagnostic tool for teachers dealing with this problem. L. A. Pechstein (University of Cincinnati).

634. Freyd, M., Personalities of the Socially and Mechanically Inclined. *Psychol. Mono.*, 1924, 33, No. 4.

Without assuming personality "types" of the sort the title of this monograph might imply, the author presents a method of differentiating "extremes" in personality, contrasting "men whose primary interest is social" with "men whose primary interest is in machines." The subjects were groups of salesmen and groups of engineering and mechanics students. For purposes of comparison, a short intelligence test, a group form of the Downey will-temperament tests, the Kent-Rosanoff free association test, a new test of "directed association," questionnaires on early personal history, vocational interests, avocational interests, likes and dislikes, beliefs, and a graphic rating scale for various traits were used. The results were used to give simple group comparisons, and in addition to this the intercorrelations of certain of the measures. Total scores were obtained in which the significant items for differentiation were given suitable weighting, these total scores clearly differentiating nearly all the members of the sales group from those of the mechanical group.

The interquartile ranges do not overlap; the overlapping of the entire distributions is less than one-fourth, "which may include all those individuals who are vocationally misplaced."

On the whole, men who prefer to handle or motivate human beings (salesmen), rather than to handle machines or inanimate objects, show greater social ability, credulity or suggestibility, adaptability, excitability, self-confidence, talkativeness, present-mindedness, and good nature, but show less tendency to be self-conscious, careful of details, inhibited and cautious, reticent, absent-minded and glum, and less ability to make fine coördinations and to give slow, painstaking, and accurate effort. The author suggests for later study the relationship between the psychological concepts of extroversion and introversion and the traits of the socially and mechanically inclined. The origin of some of the personality differences is definitely found in early environment, family history, maternal versus paternal influence, compensation for felt lacks, etc. L. A. PECHSTEIN (University of Cincinnati).

635. FREEMAN, F. N., A Scientific Study of Visual Education. *J. Educ. Res.*, 1924, **10**, 375–385.

Critical discussion of the importance (too often overemphasized) of the use of motion pictures in education. S. W. FERNBERGER (Pennsylvania).

636. TERMAN, L. M., The Possibilities and Limitations of Training. *J. Educ. Res.*, 1924, **10**, 335–343.

Program of a committee of the National Society for the Study of Education which proposes "measuring up our methods against our raw material in order to find what each contributes to our educational product." S. W. FERNBERGER (Pennsylvania).

637. OATES, D. W., The Nature and Validity of Subjective Estimates of Intelligence. *Forum of Ed.*, 1924, 2, 103–121.

Two hundred and seventy-six English secondary school boys were the subjects of an investigation which compared (1) Teachers' Estimates, (2) School Examinations, and (3) Group Intelligence Tests. The method of partial correlation shows that (1) and (2) have much in common that is not included in (3). The high reliability coefficient of teachers' estimates is produced chiefly by a common tendency to judge intelligence from actual school success.

The poor correlation between teachers' estimates and intelligence tests is attributed to the neglect of age factors, and the tendency of teachers in making judgments to be influenced by extraneous character traits. H. E. Jones (Columbia).

638. Newcomb, E., A Study of the Appreciation of Beauty in School Children. *Forum of Ed.*, 1924, **2**, 1–14, 128–132.

Two thousand children, from seven through thirteen years of age, were asked to write fifteen-minute school compositions on "The most beautiful thing I have ever seen." The results are analyzed according to topics chosen, with tabulations of age, sex, race, and sectional differences. A tentative age scale for compositions is proposed, based on choice of subject, esthetic attention span, and mention of definite elements of beauty. H. E. Jones (Columbia).

639. Ritchie, F. M., Some Effects of Prolonged Unvaried Mental Work. *Forum of Ed.*, 1924, **2**, 48–61, 83–98.

Three subjects performed the Kraepelin multiplication test for ten hours, a rest of ten minutes being allowed after each two hours. Practice periods were given before and following each experiment. Although the experiment was repeated in one case until nearly sixty hours of practice had been obtained, it was evident that the limit of improvement was not reached. The author casts doubt upon much previous work in mental fatigue, in which a freedom from practice effect has been assumed. H. E. Jones (Columbia).

640. Freeman, F. N., and Carter, T. M., A New Measure of the Carpal Bones and Its Relation to Physical and Mental Development. *J. Educ. Psychol.*, 1924, **15**, 257–270.

This study, along the lines developed by Baldwin of measuring physiological development by the carpal bones of the wrist, carries the investigation farther in that it attempts to distinguish between size and stage of development, that is, to measure the distance which the individual has traveled along the road to maturity or precocity. The method used was to first measure the area of a quadrilateral made by drawing lines from fixed points in the wrist and calling the area the carpal quadrilateral. The sum of the areas of the projections of the carpal bones was then found and called the total ossification. The ration of the total ossification to the carpal quadrilateral is the final measure used in the study and is called the ossification

ratio. Reliability is determined by studies in sex differences. Results obtained do not indicate that rate of physical growth is correlated with the rate of mental growth. Chronological age then remains a better base for calculating brightness than physiological age would be, and the classification of children in schools remains a function of mental tests rather than a possible inference from physical measurements. J. D. WEINLAND (Lehigh).

641. PETERSON, J., Johnson's Measurement of Rate of Improvement Under Practice. *J. Educ. Psychol.*, 1924, **15**, 271–275.

Peterson gives a different statistical treatment here of data published by O. J. Johnson on "A Study of the Relation Between Ability to Learn and Intelligence as Measured by Tests," *J. Educ. Psychol.*, 1923, **14**, 540–544. Johnson concluded that brighter subjects improve faster than dull ones, while Peterson, from the same data, concludes the reverse. Johnson used as his measure the amount of work done in ten minutes; Peterson plots the data in terms of the time required to do a given amount of work. The study suggests that sometimes intelligence graded as superior may be found so because of greater practice, than the average, in the functions tested. If so, we are undoubtedly taking too little account in intelligence tests of the respective amount of practice in the functions involved by the different subjects. J. D. WEINLAND (Lehigh).

642. WALTERS, F. C., Language Handicap and the Stanford Revision of the Binet-Simon Tests. *J. Educ. Psychol.*, 1924, **15**, 276–284.

This study was made with grade 6 B and 7 A, New York school children. The general plan of procedure was the comparison of scores made in nonlanguage tests scores made on tests presupposing average ability in English usage. The nonlanguage tests were such as the ball and field, induction tests, clock tests, etc. The language tests were such as vocabulary, naming sixty words, fables, etc. The children were divided into groups determined by the amount of English or foreign language used in the home. The conclusion reached is that there is a language handicap of from six to eight months mental age in children thirteen years old coming from foreign-language speaking homes. J. D. WEINLAND (Lehigh).

643. Ruch, R. M., and Cossman, L. H., Standardized Content in High School Biology. *J. Educ. Psychol.*, 1924, **15**, 285–286.

This is an attempt to establish the proper essentials for a high school course in biology by the method of finding out what the best schools are teaching. An analysis of the examinations from 126 schools furnished the data, 12,000 questions in all. These analyzed for frequency and condensed to 300 were submitted to about 100 leading teachers and authorities on biology for rating. Tables are given presenting the rating of the judges, together with condensed statements of the items rated. J. D. Weinland (Lehigh).

644. Thorndike, E. L., The Improvement of Mental Measurements. *J. Educ. Res.*, 1925, **11**, 1–11.

A general discussion of ways of improving the scoring and interpretation of mental measurements. S. W. Fernberger (Pennsylvania).

645. Charters, J. A., How Two Hundred and Fifty-Eight Junior College Women Study. *J. Educ. Res.*, 1925, **11**, 41–48.

Reports the results of a questionnaire for the studying of a text assignment in which it turns out that the whole method is employed by only a very few students and that their ideas regarding efficient methods of study are very vague indeed. S. W. Fernberger (Pennsylvania).

646. Gates, A. I., A Critique of Methods of Estimating and Measuring the Transfer of Training. *J. Educ. Psychol.*, 1924, **15**, 545–558.

The problem of this survey carries with it three aspects of a rather important nature. The limitations of control group technique generally used are constructively criticised and carefully discussed. Specific tests, such as *word-perception, picture-name-writing,* and *digit cancellation,* are introduced to check up the present method, each test being particularly significant for the function it trained. The quantitative results, measured in terms of multiples of the standard deviations of the distributions of ability, indicate a small amount of transfer. The results, of course, depend upon the similarity of the material and the method of scoring. The second question inquires whether the amount of transfer from one function to another can be foretold. Five psychologists estimated the degrees of transfer to

the function indicated. After scrutinizing the statistics it is seen that the predictions of competent judges ". . . are suggestive substitutes for experimentation under certain conditions when sane objective guidance is provided." The third aspect, predictions of transfer based on intercorrelations of the initial tests, while advisable, has received too severe treatment. Still it proves to be a valuable check on the experimental work, especially where large differences appear making imperative further investigation along similar lines. Results predicted by statistical analysis of initial tests need elucidation in order to validate conclusions drawn from correlation methods. G. M. MICHAELS (Columbia University).

647. HAGGERTY, M. E., and NASH, H. B., Mental Capacity of Children and Paternal Occupation. *J. of Educ. Psychol.*, 1924, **15**, 559–572.

Is the child's standing in school dependent upon paternal occupation? The answer to this delicate question is attempted with the aid of the Haggerty Intelligence Examination Delta 2, given to 8,121 school children. It is interesting to mention that the authors were able to get a group of subjects in one state (New York) approximating very closely the distribution of occupations of adults as listed by the United States survey. The five main groups of occupations are *professional, business and clerical, skilled and semi-skilled, agricultural,* and *unskilled.* Under these main heads are listed fifty-five occupations. Three-fourths of the children of druggists, physicians, teachers, brokers, officials, etc., are more capable of carrying on the work in the elementary schools than are the children of miners, stone-workers, laborers, farmers, bakers, etc. That is, a little more than 25 per cent of the latter group are able to get as much out of the work as are 75 per cent of the former. The following are the median scores obtained: *Professional,* 121; *business and clerical,* 112; *unskilled,* 111; *skilled,* 108; *semi-skilled,* 108; *farmer,* 106. These data represent the scores of those groups in the high schools. The occupation of the parents seems to have some effect on the success of their children in school. The children of the professional class are found to be superior, with the result that a change in the curriculum is inevitable if we are to justify our claims that a child is entitled to an education commensurate with his or her ability to grasp the subject matter. G. M. MICHAELS (Columbia University).

648. Englehardt, J. L., A Test of Physical Efficiency. The Correlation Between Results Therefrom and Results from Tests of Mental Efficiency. *J. of Educ. Psychol.,* 1924, 15, 573–578.

With the aid of a modification of a test by Dr. D. A. Sargent, the author is of the opinion he has established a satisfactory index of the physical efficiency of an individual. Where Dr. Sargent's technique involved a single vertical jump, Englehardt introduced a succession of jumps executed as rapidly as possible within a specific time limit of fifteen seconds. This may ultimately prove to be an adequate measure of one's driving power or "physical efficiency." The apparatus for recording is so arranged that except for giving instructions and timing, the experimenter can work up the data in a few moments at any convenient time. After considerable experimentation it was necessary to use two separate formulae: (1) for university students, (2) for junior high school students. Formulae for calculating the indices are given. G. M. Michaels (Columbia University).

649. Wager, R. E., Fixation-Accommodation Rates as Factors in Reading. *J. of Educ. Psychol.,* 1924, 15, 579–587.

The native muscular reaction-time is an essential factor in fixing the reading rate. That such muscular readjustments take place with every fixation pause has been clearly demonstrated. Besides, individuals differ in the number of fixations per line, from which follows that the "span or width in the field of regard" also varies per each individual. A clear description of the apparatus in this work can be obtained on page 579 of the Journal. The results were recorded by the kymograph and camera, and the objective data therein contained are proof of the importance of differences in motor reaction-times in reading rates. Individuals show marked dissimilarity in two important respects: First, the variability in the rate of reading; second, the variability in the fixation-accommodation-times involved in the shifting of the field of regard from a far to a near plane as well as from a near to a distant plans. G. M. Michaels (Columbia University).

650. NEIFELD, M. R., Formulas for Facilitating the Computation of the Mean of the Distribution Obtained by Combining Component Distributions. *J. of Educ. Psychol.*, 1924, 15, 588–591.

In getting averages of averages where the number of cases in each distribution is not the same, the formulas here presented are valuable as time-saving devices. They aid us in estimating the probable change in the mean of a distribution " when one or more component series are either subtracted from or added to the entire distribution." The reviewer ventures to say that some of the results arrived at in the past few years from the studies dealing with the intelligence of immigrants who have come to our shores in the last half century can be *entirely invalidated* by the use of these formulas. Their use is advised not only for the time they save in computation but for their more valuable asset of giving a truer picture of actual facts. G. M. MICHAELS (Columbia University).

651. REED, A. B., A Further Note on the Whole and Part Method. *J. of Educ. Psychol.*, 1924, 15, 592–595.

In reply to a recent paper by Warner Brown that the whole method of learning is better than the part method evidence is presented here that from the standpoint of number of cases available in the experiments the latter holds a more favorable position on which to base its supremacy. This is further reinforced by data from advocates of the whole method if properly interpreted. Ebert and Meumann, Ephrussi, Pechstein, and part of the data from the work of Larjuier des Bansels and Pentschew have the records of 177 subjects to verify the part method, as compared with only 43 subjects, excluding Warner Brown and Neumann (they not giving the number), who advocate the whole method of learning. The author, no doubt, realizes that the number of subjects, while an important factor, does not either validate or invalidate the whole or part method of learning. He asks for further experimentation along these lines to settle the question. Recognizing the existence of individual differences and coming to understand more fully the value of *not losing sight of the cares of the individual,* the safer thing to do is to allow the individual to choose that method which best meets his own needs. Where special cases are found to need assistance, then both methods can be experimented with in the particular case under advisement and the remedy applied. Perhaps the same subject may

use both methods according to the tasks occupying his attention at different times. G. M. Michaels (Columbia University).

652. Herring, J. P., Verification of Group Examination. *J. of Educ. Psychol.*, 1924, **15**, 596–602.

Is it necessary to verify extreme and crucial cases by individual tests after having their records from group tests? From the number per thousand tested according to a table presented in this discussion, the more heterogeneous the group the smaller the proportion necessary to be remeasured. Furthermore, the more reliable the test, the less need for remeasurement. For example, if the reliability correlation of a test is .85 "determined in unselected age groups," then the following is what can be expected:

873 per 1,000 may be mismeasured by 2 mental months or more.
759 per 1,000 may be mismeasured by 4 mental months or more.
529 per 1,000 may be mismeasured by 8 mental months or more.
347 per 1,000 may be mismeasured by 12 mental months or more.

Whether one is to use a group test or an individual test depends entirely upon the purpose for which the data is intended. Central tendency, dispersion, correlation, etc., may be reliable when studied from the standpoint of the group, but may be led to other results from the point of view of individual data. G. M. Michaels (Columbia University).

653. Shuttleworth, F. K., Method of Measuring Character Traits. *Sch. and Soc.*, 1924, **19**, 679–682.

Reports a study made at the University of Iowa. Forty-one fraternity members were rated by one another for five degrees of money-mindedness. This rating correlated .95 ± .01 with scores on 75 test elements chosen out of a total of 350. The elements consisted of such stimulae as "ministry," "successful," "service," "luxurious," "burglar," "avarice," "spirit of universal brotherhood," "mothers' pensions," "win out in the financial world," "a high powered automobile," etc. To each stimulus, word or phrase or sentence, the subjects were asked to make one or more of seven responses, namely, indifference, and three degrees each of like and dislike. A correlation of .95 is amazing and causes the most optimistic to hesitate and question. T. F. Lentz (Columbia).

654. Horowich, I., Psychological Tests and the Selection of Antioch Students. *Sch. and Soc.,* 1924, **20**, 156–160.

Discusses aims and methods of selecting students—selecting 60 out of every 100 applicants for admission. Correlation of intelligence test scores is positive with scholastic achievement but negative with industrial record. Those making the highest and medium industrial record average 101 and 96 on the Thurstone intelligence test, while those making the lowest industrial record average 108 on the same test. The average Thurstone intelligence score for the student government officers is 102.5, for college letter athletes 83.9, and for the school as a whole 98.7. T. F. Lentz (Columbia).

655. Hart, H., and Olander, E., Sex Differences in Character as Indicated by Teachers' Ratings. *Sch. and Soc.,* 1924, **20**, 381–382.

Reports a study in Davenport, Iowa, by the Iowa Child Welfare Research Station. Fifty high school boys and fifty high school girls were rated by three or more teachers representing both sexes on each of six traits. The girls surpassed the boys in sincerity, honesty, and energy. There was no clear difference in rating for self-control and intelligence. T. F. Lentz (Columbia).

656. Hart, H., Correlations Between Intelligence Quotients of Siblings. *Sch. and Soc.,* 1924, **20**, 382.

Intelligence quotients were secured by the Stanford-Binet tests on three groups of children comprising 618 pairs of siblings. The correlation coefficients were found to be $.447 \pm .034$, $.459 \pm .006$, $.399 \pm .057$. T. F. Lentz (Columbia).

657. Brooks, F. D., The Transfer of Training in Relation to Intelligence. *J. Educ. Psychol.,* 1924, **15**, 401–413.

This study was made with children in the Baltimore schools, doing their regular work, and bears the signs of certain limitations due to necessary school restrictions. Transfer effects were found in the functions tested, multiplication and substitution, but these transfers had almost a neutral relation to intelligence. The highest mean correlation found was that of .069 with seventh and eighth grade children. Brooks points out that before the problem of transfer can be solved extensive knowledge of practice effects in taking tests for different chronological ages and mental levels will have to be gathered.

Longer periods of training will have to be considered and the permanency of transfers tested. S. D. WEINLAND (Lehigh).

658. SYMONDS, P. M., The Accuracy of Certain Standard Tests for School Sectioning and Marking. *J. Educ. Psychol.,* 1924, **15**, 423–432.

The data for this study is taken from a testing program previously described, by the same author, in the *Journal of Educational Research,* March, 1904. In this paper Symonds discusses the accuracy of derived scores which have been used to make tests more useful. "Age," such as mental age, educational age, arithmetic age, etc., are discussed; also I.Q. and Accomplishment Ratio. Two emphasized conclusions are that the Arithmetic Accomplishment Ratio obtained from single tests as a measure to be used for school marks is of the same order of reliability as ordinary school marks. And second, that the Accomplishment Ratio is more accurate, as it may be used as a school mark when the test scores themselves are accurate for the purposes of school grading or classification. S. D. WEINLAND (Lehigh).

659. THOMSON, G. H., and PINTNER, R., Spurious Correlation and Relationship Between Tests. *J. Educ. Psychol.,* 1924, **15**, 433–444.

The authors here point out the error of assuming that a high correlation indicates a high degree of relationship unless attention is paid to the number of cases involved, the spread of chronological ages of the subjects examined, and the homogeneity in mental ability of the group considered. They maintain that the only safe measure for correlational comparison of tests is the correlation of mental ages for constant chronological age or, what is identical with this, of Intelligence Quotients for constant chronological age. Examples are given showing how disregarding this warning may raise a correlation from .10 to .85 or from 0 to .50, giving a thoroughly mistaken and misleading result. It is suggested that neglect of these principles in the past may have caused erroneous deductions in such matters as the degree of resemblance between two tests, reliability coefficients, the constancy of the I.Q. as judged by correlations between I.Q.'s on the same test at different times, and other similar problems. S. D. WEINLAND (Lehigh).

660. Holzinger, K. J., On Scoring Multiple Response Tests. *J. Educ. Psychol.*, 1924, **15**, 445–447.

In a brief note it is shown that in scoring right-wrong tests the score of simple rights gives a plus one correlation with the score calculated by rights minus wrongs in all cases where every subject is allowed to finish and given a chance on all the problems. Thurston's method, published in the *Psychol. Bull.*, 1919, **16**, is referred to. Holzinger gives a brief example of his thesis, with formulae. S. D. Weinland (Lehigh).

661. Brown, W. M., A Study of the Predictive Value of Certain Kinds of Scores in Intelligence Tests. *J. Educ. Psychol.*, 1924, **15**, 448–461.

Brown points out in this study that personality traits are exercised in taking a test that has been devised with the sole intention of measuring intelligence. By taking minus and zero scores as an index of willingness or unwillingness to take a chance, or of caution or rashness, it is quite obvious that what one does on an intelligence examination leaves behind certain evidences of character. Similarly tests devised to measure character shows signs of the intelligence of the examinee. Brown believes that soon a single composite test will be employed to measure the most important phases of an individual's intelligence and character at one and the same time. The present study makes use of data obtained from the Thorndike entrance examinations at Columbia University. The method of procedure is explained and tables given. The influence of negative scores was found particularly marked. S. D. Weinland (Lehigh).

12. MENTAL EVOLUTION

662. Plath, O. E., Do Anesthetized Bees Lose Their Memory? *Amer. Nat.*, 1924, **58**, 162–166.

Neither bumblebees nor hivebees lose their "memory" on being etherized, according to the author's experiments. These results are in disagreement with those of von Buttel-Reepen and Phillips. The discrepancy is explained by the evident fact that in the latter experiments the bees were injured and weakened by too great a dose of the anesthetic. R. H. Wheeler (Oregon).

663. Pearl, R., and Parker, S., Experimental Studies on the Duration of Life. *Amer. Nat.*, 1924, **58**, 193–218.

The duration of life of 3,632 individuals of *Drosophila* was studied under conditions of complete starvation. Under these conditions the vestigial type give a life-curve nearly the same as the wild type, although under conditions of full feeding the latter lives roughly three times as long. Under starvation the relative variability in duration of life is much reduced. Females live longer than males under both conditions, and are more variable than the males. The genetic significance of these results is discussed. Their important bearing is that the somatic expression of any genetic factor in any particular case is in part a function of the general environment which prevails in that case. R. H. Wheeler (Oregon).

664. Babcock, E. B., Species Hybrids in Crepis and Their Bearing upon Evolution. *Amer. Nat.*, 1924, **58**, 296–310.

A genetic analysis of *Crepis capillaris* shows that gene or point mutations cause polymorphism within a plant species. But such a process, it is believed, can never bring about the origin of species having new chromosome numbers. Experiments on *C. biennis* indicate that an increased number of chromosomes may originate through irregularities in the mechanism of chromosome distribution. Tests made by crossing *setosa* and *capillaris* and *setosa* and *biennis* show that new species with different chromosome numbers may evidently originate through hybridization of old species. Thus there is evidence to support both the mutationist's and the hybridist's conception of the method of evolution. Natural selection among the individuals of new species that have recently arisen through mutation or hybridization must be hypothecated in a state of nature. The inheritance of acquired characters, especially the effects of environment on plants, *may* act, separately or together with mutation and hybridization, as a slow but definite factor in evolution. R. H. Wheeler (Oregon).

665. Reed, H. S., The Nature of Growth. *Amer. Nat.*, 1924, **58**, 337–349.

From facts of growth presented in some detail the author concludes that growth is a dynamic process which causes enlargement and differentiation in organisms. An emphasis is placed on a continuity in the growth process which has hitherto been unappreciated by physiologists. There is a dynamic equilibrium with surroundings,

and this equilibrium is a problem in chemical dynamics. It is a dynamic change in which increase in size is equal to an exponential function of time. R. H. WHEELER (Oregon).

666. LINEBURG, B., Communication by Scent in the Honey Bee—a Theory. *Amer. Nat.*, 1924, **58**, 530–537.

Observations are cited leading to the conclusion that the glands of Nassanoff are scent-producing organs used when the bee detects a source of food. A scented trail through the air enables other bees in the vicinity to find the same source of food at once. In the same way this emitted scent serves to attract other bees to the entrance of a hive. The gland seems to be exposed while the bee " fans " the air with its wings, even after lighting. It is held that other bees are attracted by the odor, rather than by the sound. The author is inclined to reject sight theories and the theory of general search which have been advanced to explain the behavior of bees in locating new hives or sources of food. R. H. WHEELER (Oregon).

667. HAMMETT, F. S., The Differential Development of the Albino Rat from 75 to 150 Days of Age and the Influence of Thyro-parathyroidectomy and Parathyroidectomy Thereon. *Amer. J. of Physiol.*, 1924, **70**, 259–272. M. J. ZIGLER (Wellesley).

668. GREENE, C. W., Physiological Reactions and Structure of the Vocal Apparatus of the California Singing Fish, *Porichthys Notatus*. *Amer. J. of Physiol.*, 1924, **70**, 496–499.

Description, with illustrations, of the structure and *modus operandi* of the vocal apparatus of this fish, along with an account of the general behavior characteristic of this genus. M. J. ZIGLER (Wellesley).

669. GREENE, C. W., and GREENE, H. H., Phosphorescence of *Porichthys Notatus*, the California Singing Fish. *Amer. J. of Physiol.*, 1924, **70**, 500–506.

Under intense stimulation and excitement this fish produces a light by means of organs which are designated as truly phosphorescent organs. Injection of suprarenal extract causes a very prolonged and brilliantly luminous appearance of these organs, hence it is suggested that they are not under nervous control but under that of a hormone. M. J. ZIGLER (Wellesley).

670. Fries, J. A., and Kriss, M., Metabolism of Cattle During Standing and Lying. *Amer. J. of Physiol.,* 1924, **71**, 60–83. M. J. Zigler (Wellesley).

671. Mast, S. O., and Dolley, Wm. L., The Relation Between the Stimulating Efficiency of Intermittent Light and the Length of the Light and the Dark Periods. *Amer. J. of Physiol.,* 1924, **71**, 163–173.

Observations made on the butterfly, *Vanessa antiopa,* as to the relative stimulating efficiency of light in varying the length of the light and dark periods. M. J. Zigler (Wellesley).

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It is with regret that we announce the resignation of Dr. W. V. Bingham as coöperating editor of the BULLETIN. Professor Rudolf Pintner of Teachers College, Columbia University, has been appointed coöperating editor in his stead.

PROFESSOR R. S. WOODWORTH has resigned as coöperating editor of the BULLETIN to become an advisory editor of the *Psychological Review*.

YALE University announces the appointment of Professor Harold C. Bingham, of Wesleyan University, as research associate in the Institute of Psychology and the appointments of Carleton F. Schofield and Donald K. Adams as research assistants.

PROFESSOR WOLFGANG KÖHLER, of the University of Berlin, delivered a Spencer Trask Lecture on the Intelligence of Apes at Princeton University on April 8, and Professor Edward Bradford Titchener spoke upon the History of Experimental Psychology on April 9, in honor of Princeton's new psychological laboratory.

THE Iowa Child Welfare Research Station of the University of Iowa has received a grant of $133,500 from the Laura Spelman Rockefeller Memorial Fund to be used for research in the development of children.
children.

HARVARD University has announced the appointment of Dr. Wolfgang Köhler of the University of Berlin as visiting lecturer for the first half of the academic year 1925–26.

THE fifth annual meeting of the Western Psychological Association will be held on July 24–25, 1925, at Berkeley, California. Psychologists are cordially invited to attend. Correspondence may be directed to the Secretary, Professor W. R. Miles, Stanford University, California, or to Professor E. C. Tolman, University of California, Berkeley, California, who is in charge of the local arrangements.

HORACE B. ENGLISH, professor of psychology at Antioch College, has been appointed associate professor of psychology at Wesleyan University.

DR. JOHN E. ANDERSON, assistant professor of psychology in Yale University, has been appointed Director of the Institute of Child Welfare to be organized at the University of Minnesota next year.

THE Board of National Research Fellowships in the Biological Sciences met on April 30 and made the following appointments and reappointments in psychology for the year 1925–1926: N. D. Hirsch, L. E. Travis, H. C. Blodgett, M. F. Metfessel and P. A. Pattie, Jr.

PROFESSOR RAYMOND H. WHEELER, of the University of Oregon, has been appointed professor of psychology at the University of Kansas.

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THE
PSYCHOLOGICAL BULLETIN

THE CONDITIONED REFLEX OR CONDITIONED RESPONSE AS A COMMON ACTIVITY OF LIVING ORGANISMS

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Introduction. Yerkes and Morgulis' review of "The Method of Pawlow in Animal Psychology" (168) was based principally on six papers by Pawlow, Nicolai, Zelyoniy, and Orbeli, and was written in 1909. Many other experimental reports and general discussions are now available, and the following summary will show that although the scientific study of the conditioned reflex originated in the physiological laboratory of Pawlow, many writers have used it in the study of animal, genetic, human adult, and abnormal psychology. Physiologists classify the conditioned reflex in that large and convenient group of phenomena called psychic, and they frequently refer to it as a psychic or cerebral reflex. Many psychologists still use the physiologists' term "reflex" in referring to this form of behavior. Since the conditioned response principle is now used rather widely in psychology, hygiene and social science, and because of the narrow meaning of the term "reflex" in biology, it seems desirable to use the term "response" in the place of "reflex." The term "response" does not exclude the reflexes, and it has the advantage of including many forms of behavior which are not strictly "reflex" in nature. However, in many cases it makes very little difference whether the activity in question can be properly called "reflex" or not. We shall use "C-R" as an abbreviation for conditioned response in this review.

The C-R principle does not necessarily have a mechanistic or behavioristic connotation. Although much of the experimental work which we shall summarize is a flat contradiction of vitalistic fancies and purposive psychology, it should be noted that the C-R principle does not exclude introspection or even structuralism. It deserves to be considered in the same class with memory, emotion, etc., simply as a good subject for psychological investigation. The C-R was clearly discussed by Locke and others as a part of the associationists' problem, and it resembles many other phases of modern science and philosophy in being an old concept. It has played a part in directing attention to the stimulus-response idea in association as opposed to a connection between two ideas or between two external objects. It is a significant fact that as far as the C-R principle is concerned the signs of structural psychology and behavior psychology now point in the same direction, just as one would expect in a monistic world. (32, 33)

Historical. Locke gave a foreshadowing of the C-R rule in his "*Essay Concerning Human Understanding.*" (96) In the last chapter of Book 2, on the "association of ideas," he gives several examples of C-R's in describing the acquisition of everyday antipathies and aversions, and a broad application of the concept is made. "Instances of this kind," Locke writes, "are so plentiful everywhere, that if I add one more, it is only for the pleasant oddness of it. It is of a young gentleman, who having learned to dance, and that to great perfection, there happened to stand an old trunk in the room where he learned. The idea of this remarkable piece of household stuff had so mixed itself with the turns and steps of all his dances, that though in that chamber he could dance excellently well, yet it was only whilst that trunk was there; nor could be perform well in any other place unless that or some such other trunk has its due position in the room." In Book 3, ch. 9, Locke carries the same explanatory principle to the language mechanism: "If we will observe how children learn languages, we shall find that to make them understand what the names of simple ideas, or substances, stand for, people ordinarily show them the thing whereof they would have them have the idea; and then repeat to them the name that stands for it, as white, sweet, milk, sugar, cat, dog." Thus in 1690 we see that the idea of "conditioning" was important and commonplace; to-day it seems to be important because it is commonplace. Locke's theory of association was complicated by his views on "reflection,"

now long since discarded, and he considered that the involuntary association of ideas was a " disease of the understanding."

Although Leibnitz's *" New Essays "* were forced into a philosophical system, he had a friendly attitude towards Locke's statements concerning the C-R principle. " This remark," he comments, " is important and wholly to my taste, and can be fortified by an infinite number of examples. Descartes having had in his youth some affection for a squint-eyed person, could not prevent himself from having all his life an inclination towards those who had this defect." (95, pp. 281–284) Cousin was another able critic of Locke; and even with his spiritualistic keynote he stated in 1829 that " he [Locke] has shown by a multiude of examples how it frequently happens that, simply because we have seen two things by chance united, this purely accidental association subsists in the imagination and perverts the understanding. This is a source of a multitude of errors, not only of false ideas, but of false sentiments, of arbitrary antipathies and sympathies, which not unfrequently degenerate into insanity [*sic*]. We find here in Locke the wisest councils for the education of the soul and of the mind. . . . This whole chapter [on the association of ideas] shows the ingenious observer, and the true philosopher. . . ." (38, pp. 128–130) In 1794 Erasmus Darwin wrote that " all the fibrous motions, whether muscular or sensual, which are frequently brought into action together, either in combined tribes, or in successive trains, become so connected by habit, that when one of them is reproduced the others have a tendency to succeed or accompany it." (41, p. 34)

There is a close resemblance between the C-R and the " law of contiguity " as some writers state it. James' formulation will serve as an illustration: " When two elementary brain-processes have been active together or in immediate succession, one of them, on recurring, tends to propagate its excitement into the other." (66, p. 566) A few writers still refer to contiguity as *the* law of association and learning. Basing his views on some very extensive work in the fields of comparative physiology and comparative psychology, Loeb concluded that the most important problem in the physiology of the central nervous system was the function of an elementary process called associative memory. (97, pp. 213–234) We recognize the C-R mechanism in his definition of this process: " By associative memory I mean that mechanism by which a stimulus brings about not only the effects which its nature and the specific structure of the irritable organ call for, but by which it brings about also the effects of other

stimuli which formerly acted upon the organism almost or quite simultaneously with the stimulus in question." (97, p. 12) Loeb believed that associative memory could modify any of the reflex and instinctive motor processes in man. As late as 1918 Loeb once more stated the C-R principle in the same way in his definition of associative memory.(98, pp. 164–172) He also held that all psychic phenomena are functions of associative memory,(99, pp. 235–244) and that " the criteria for the existence of associative memory must form the basis of a future comparative psychology." (98, p. 218)

The Pawlow School. While it has been known for some time that various stimuli may affect the digestive system, it remained for Pawlow[1] to demonstrate the very close connection between the activity of the secretory glands in the stomach of the dog and the nervous impulses coming from the head region.(151, 120, 125, 122) His work on conditioned salivary reflexes in the dog grew out of this larger problem.(4, 128) Pawlow was awarded the Nobel prize in medicine in 1904, which date practically marks the beginning of his study of conditioned reflexes.(64) Most of the experiments were carried out in a very well-equipped laboratory.(127, 129, 111) The dog's salivary glands were found to be well suited to this kind of study, because they function readily and the saliva can be measured quantitatively. Since it was found that any stimulus affecting the dog can be associated with the flow of saliva,(65) and since many changes in the activity of the nervous system affect the salivary glands, and also because some external cause can be recognized every time the saliva flows, Pawlow decided to make an extensive investigation of the functions of the central nervous system by this method. A mass of information has been obtained in this way about the psychology of the dog.(121, 124, 171, 123, 55)

Pawlow is interested in the responses of animals to external conditions, and he believes that these responses include all of the higher mental processes in the dog as well as in man. He objects strenuously to explanations in terms of " psychology," and wishes " to restore to physiology what properly belongs to it." (123, p. 614; 105) His argument runs that since psychology is not yet an " exact " science, *physiology* can gain nothing from it! (130, p. 973) Pawlow believes that he has been justified in introducing the idea of conditioned reflexes in physiology, because it is a direct inference from the experimental facts. For him the C-R is an elementary process.

[1] Sometimes spelled " Pavlov," " Pawlow," or " Pavloff."

Most of the animals used by Pawlow belonged to a healthy mixed race of hunting dogs, having a copious flow of saliva. Acid, meat powder and sugar, etc., were used for the "unconditioned" stimuli. The conditioned stimulus may be given a short time before, or with, the unconditioned stimulus, but if it is given after the unconditioned stimulus no salivary reflex will take place. This is due to the highly complicated process called "inhibition." (129, 130, 126, 131) Pawlow distinguishes the various inhibitions of drowsiness or sleep, external inhibition, and internal inhibition. A physiological explanation of sleep and hypnosis is offered in terms of inhibition. (132, 130, 142) After a C-R has been established, continued repetition of the conditioned stimulus will cause it to degenerate, this being the result of the mechanism of "internal inhibition." The mechanism here is the same as that of "negative adaptation" for an unconditioned stimulus—repetition of the stimulus wears out the response. After the "internal inhibition" has functioned, it has been observed that if any strong neutral stimulus affects the dog, the inhibition itself is arrested, producing an "inhibition of an inhibition," and a copious flow of saliva will result. (129, 117) Pawlow thus regards inhibition as an active process. (43, pp. 64–85; 144) He has given a restatement of his views on this subject as late as 1923. (135)

Pawlow has worked out a complicated theory of the functioning of the central nervous system based mostly on experimental work. (130, 123, 126, 111) The higher activities of the nervous system are explained by the work of two mechanisms—the conditioned reflex and the "analyzer." The analyzers are conceived as "specialized parts of the central nervous system, in each of which we must include the peripheral end-organ of the so-called sense organs, the nerve fiber belonging to it, and its termination in the cells of the cerebral hemispheres." (130, p. 974) The function of the analyzers is to analyze the particular phenomena of the external world to which the animal responds, and "pick out from them certain special components." This analysis "lies in very close relationship to the formation of new reflexes." The effect of destroying certain parts of the cerebral hemispheres on the functioning of the conditioned reflexes and analyzers has also been studied. (130, 176, 169) Investigations on cerebral physiology by the C-R method have been reported by Pawlow as late as 1921, (134, 133) and he discussed the excitability of the brain cortex in 1923. (137)

Although Loeb has claimed that Pawlow's method of studying associative memory is the only one which satisfies the demands of

quantitative science,(98, p. 165) we cannot avoid the feeling that Pawlow draws too many conclusions from his experiments. Very little is said about the reliability of the results. Pawlow does not seem to be very well acquainted with the researches of animal psychologists in this country, and the value of his work would also have been increased if he had not limited himself almost entirely to the study of the salivary reflexes of the dog. Watson has pointed out that the conditioned salivary reflex method cannot be used on most of the lower animals.(155, pp. 67, 68)

It is impossible to separate Pawlow's work from that of his students. Zelyonîy [2] has studied the auditory reactions of the dog,(172, 173, 174) and his dissertation (172) has been summarized by Yerkes and Morgulis.(168) Zelyoniy claims that the dogs he used could distinguish between separate sounds which differed from one another by only a quarter of a tone, and that the dog may remember this differentiation for two months. Some specificity was also claimed for the quality of sounds. Bielakoff established conditioned salivary reflexes in the dog to sound and movement. He claims that the dog can differentiate one-eighth of a tone.(15; 43, pp. 33–40) Morgulis (110) has summarized a paper by Usiyevich,(154) who tested the dog's ability to differentiate time intervals between sounds. Usiyevich concluded that the dog could distinguish between 96 and 100 beats of a metronome per minute. Memory for this differentiation was very good after one hour, but disappeared after forty-five hours. Anrep (2) obtained differentiations between 637 and 680 vibrations per second in one dog. His experiment was apparently well controlled.

Orbeli studied conditioned salivary reflexes resulting from optical stimulation of the dog.(118, 143, 168) The visual analyzers were found to be considerably less efficient than the auditory. Some evidence was obtained which apparently indicated that the dog is sensitive to changes in intensity of light, but not sensitive to changes in wave-length. Orbeli also concluded that nervous tissue will respond more actively to an intermittent light stimulus than to a continuous one.

Kasherininova (78) made a study of the tactile analyzer of the dog, and found that it possessed a high degree of specificity. Anrep also reports an investigation in which the salivary reflexes of the dog were associated with cutaneous stimulation.(3) Each of the three

[2] Sometimes spelled "Zeljony," "Zéliony," or "Selionyi."

dogs which Anrep experimented upon had a permanent fistula of the parotid salivary gland. "The degree of irradiation of tactile conditioned reflexes," Anrep says, "depends on the length of the pause between the conditioned and the unconditioned stimulus."

In contrast with Pawlow's point of view, Nicolai used the conditioned salivary reflex method in attempting to study the mental reactions of the dog.(115, 116) The graphic method of measuring the flow of saliva was introduced by him in Germany. By the use of this method the experimenter can leave the room while the experiment is in progress. Nicolai, like Orbeli, believes that the dog does not respond to differences in the wave-length of light.(115)

Experiments on the removal of certain portions of the dog's brain have convinced several of Pawlow's students that conditioned salivary reflexes depend upon the functional activity of the cerebrum. Some of Bechtereff's students did not reach the same conclusions. Following up this work, Toropoff (152) attempted to locate more definitely the anatomical basis of the conditioned reflex arc. His work is in a sense an affirmation of the theories of cortical localization."

Dontchef has criticized the "physiological" point of view adhered to by Pawlow and most of his colleagues.(43) In the first part of her book she gives a brief survey of the work of the Russian school up to 1914. Then she interprets Pawlow's work on dogs in terms of images and affective elements, from the point of view of the Paris school of psychology. She discusses the experiments of Zelyoniy and Orbeli in particular.

The interpretations which have been made of Pawlow's work show that the celebrated Russian scientist has not always been clear in stating his views. Bayliss has given a summary of Pawlow's general work in physiology,(6) and also a more detailed account of his work on C-R's.(7) Bohn stressed and probably overemphasized Pawlow's C-R method as compared with other methods in animal psychology.(18, p. 158) Mitchell gives a general treatment of Pawlow's work on C-R's,(109) and Halliburton appraises it from the chemical point of view.(50) Myerson attempted to evaluate some of Pawlow's general articles on the C-R.(114) Paton discusses Pawlow's work in connection with the general question of the modifiability of reflexes.(119)

Conditioned Responses in Lower Animals Other Than Conditioned Salivary Responses in the Dog. Metalnikoff concluded from his work on protozoa that it was possible to establish "conditioned reflexes" in one-celled animals,(106, 107) but his experiments were

not conclusive. Thompson (150) used the C-R method in making an analysis of the learning process in the snail, *Physa gyrina* Say. Pressure of a piece of lettuce in the region of the mouth of this animal will generally cause a chewing movement of the mouth parts, but this movement is not ordinarily evoked by pressure on the foot. In this experiment, pressure was repeatedly applied to the mouth, causing a movement of the mouth parts, and, simultaneously with this stimulus and this response, pressure was also applied to the foot at a fixed distance from the mouth. This training resulted in the formation of an association between pressure on the foot and a chewing movement of the mouth. Memory for this conditioned chewing reaction persisted for four days. Thompson also tested the snail's ability to learn some very simple labyrinths, but found no reliable evidence that he could learn them.

Westerfield used the C-R method in studying the ability of nine mudminnows (*Umbia limi*) to form associations with sounds.(165) The minnows were able to distinguish between 288 and 426 vibrations per second on a ukelele. The low tone was associated with food and the high tone with a distasteful flavor. McDonald used the same general method, and found that blunt-nosed minnows (*Pimephales notatus*) could form associations with sound vibrations made by a bass viol string.(103) These investigators did not determine whether the vibrations affected the minnows through the skin, the lateral line, the inner ear, or by some combination of these receptors.

Watson established conditioned motor reactions in a dog and in several chickens.(156) The reflex withdrawal movement of the dog's foot, evoked by an electric shock at first, was later associated with a sound. In another form of procedure, Watson obtained a differential reaction to two bells after four experiments lasting twenty minutes each. C-R's were also obtained in the respiratory curves of six out of seven chickens. In the same paper Watson discusses the use which may be made of the C-R method in animal psychology.

Kalischer trained dogs to take food when one sound was given and to refrain from taking it when other sounds were given.(69, 70, 141, 149) He trained the dogs by giving them the food when one sound stimulus was present, and by withholding it when other sounds were present. In some respects this method seems preferable to the salivary reflex method. Some of Kalischer's extirpation experiments seemed to indicate that subcortical centers are directly concerned in

the memory for simple reactions,(69) a conclusion, however, which does not agree with the work of the Pawlow school, nor with the more recent work of Lashley on rats.(93) Johnson (68) criticized the experiments of Kalischer (69, 70) and Zelyonîy (172) on pitch discrimination in the dog. He claims that Kalischer did not control rhythm, duration of the stimulus, and other disturbing factors. Johnson's work is in turn criticized by Anrep,(2) who seems to have also carried out a very careful experiment.

Herrick used the C-R method to form an association in a dog between the stimulus of a flock of sheep and the response of running home.(53, p. 67) Zelyonîy (175) made a brief study of the motor reactions of a kitten by the C-R method, and claimed that the kitten could distinguish between sounds which differed by only half a tone. The conditions of the experiment, however, throw some doubt upon this conclusion. The C-R method has been used extensively in the training of wild animals, and Bostock's book on this subject shows that the behavior of tigers and other wild animals frequently illustrates the C-R principle.(20) The animals' performance in a show is apparently conditioned to various elements in the situation.

A short article recently appeared in *Science* (136) in which Pawlow reports the results of an investigation on the inheritance of acquired characters. He says: "The latest experiments (which are not yet finished) show that the conditioned reflexes, *i.e.*, the highest nervous activity, are inherited. At present some experiments on white mice have been completed. Conditioned reflexes to electric bells are formed, so that animals are trained to run to their feeding place on the ringing of the bell. The following results have been obtained: The first generation of white mice required 300 lessons. . . . The second generation required, for the same result, only 100 lessons. The third generation learned to do it after 30 lessons. The fourth generation required only 10 lessons. The last generation which I saw before leaving Petrograd learned the lesson after 5 repetitions. The sixth generation will be tested after my return. I think it very probable that after some time a new generation of mice will run to the feeding place on hearing the bell with no previous lesson." (136, pp. 360, 361)

May and Larson (102) used Kalischer's C-R method in a study of posture-sense conduction paths in the spinal cord. They trained three dogs to accept food when the right hind leg was rigidly extended and to refuse food when the same foot was in any other

position. Lang and Olmsted (89) used the C-R method described by Watson (156) in a further study of pathways in the spinal cord. They state that " a conditioned reflex to pain involving the left hind leg in dogs was abolished by hemisecting the cord at the level of the first lumbar vertebra on the side opposite to the trained leg. The reflex could be reëstablished after a comparatively long period of training, although the sensation of pain was apparently absent. . . . The reëstablished conditioned reflex was abolished by a second hemisection of the cord on the opposite side several segments nearer the brain. . . ." (89, p. 611) Baer gives considerable evidence to show that C-R's may be established in a dog by direct electrical stimulation of the cortex.(5) Martin and others (100) studied the effects of tactile, auditory, and thermal stimulation on the vasomotor reflexes of normal, decerebrate, and narcotized rabbits. They concluded that the vasoconstriction following mild stimulation was a secondary effect caused by psychic excitation. As long ago as 1852 Bidder and Schmidt described the secretion of gastric juice in a dog at the mere sight of food.(14) Pawlow refers to the same phenomenon in his book on the digestive glands.(125)

Conditioned Responses in Children. In 1917 Watson and Morgan advanced the theory that the original emotional patterns were few, and that the wide range of stimuli which could later call out fear, rage, and love was made possible by conditioned reflex factors.(157) In 1920 Watson and Rayner submitted this matter to an experimental test.(158) One healthy baby was used in the experiments. When the child was eleven months old it was found that he had no fear of a rat but was definitely afraid of a loud noise. Only seven combined stimulations of the loud noise and the rat were required to condition the child's fear response to the rat. Five days later it was found that the child was not afraid of certain objects about the same room, such as blocks, but he was afraid of the rat, and also showed some fear of a rabbit, dog, and seal fur coat. Other variations of the experiment showed that conditioned emotional reactions can be easily established and that they may persist for at least one month. Watson's view is that they persist throughout life and continue to influence personality. Some evidence was also obtained indicating that fear is as primal a factor as love (sex in Freudian terminology). Watson has also sketched an experimental program for the study of infant psychology.(159) Skerritt described a fear reaction in a baby seven and a third months old conditioned to the odor of a rose.(145)

Bogen reported an investigation in which he claims he was able to establish a C-R between a sound and the flow of gastric juice in a child three and a half years old.(17)

The treatment of the C-R in the 1924 edition of Watson's "Psychology" (161) is substantially the same as in the first edition except that the conditioned emotion experiment just referred to is included. Watson discusses C-R's in glandular activity and in language, and the general use of the C-R method in psychology. The following statement shows that habit and the C-R do not mean exactly the same thing: "Undoubtedly just after birth conditioned reflexes begin to form with respect to the attendants and parents long before systematized habits begin to form. In other words, there is a genuine conditioned reflex level of functioning lying between the reflex-instinct level and the organized habit level." (161, p. 280) Watson considers the C-R mechanism in his observations on "The Unverbalized in Human Behavior," (160) and in his discussion of thinking.(162) Brown has also discussed the relation between the C-R principle and language.(21)

Krasnogorski made one of the pioneer studies of young children with the C-R method. In 1907 he reported some observations on the formation of C-R's in a fourteen-month-old baby, who made movements of the mouth at the sight of milk, and later, although somewhat irregularly, when a bell stimulus was present. In 1909 Krasnogorski described an improved C-R method which he used in studying mostly six-year-old children.(86, 40, 63, 112) He associated feeding movements with various arbitrary stimuli. Further results given in 1913 (87) showed that the C-R method has a wide applicability in the study of young children. Beginning especially in the second year, the feeding reaction of the child can apparently be associated with most any stimulus. Krasnogorski studied the analyzing mechanisms, together with the inhibition and memory, for these C-R's. He also made a comparison between children and dogs, and discussed the question of cortical control.

Mateer has given a critical evaluation of Krasnogorski's technique, and with an improved C-R procedure made a very thorough investigation of sixty-seven children.(101) Her work is in large measure a verification of Krasnogorski's claims for this method. She established conditioned feeding movements to tactile stimuli in children varying in age from twelve to eighty-nine months. The children were given several mental and physical tests, and numerous cor-

relations were obtained. A comparison was also made with defectives. Feldman (45) gives a general discussion of Krasnogorski's work (87) and the C-R mechanisms in children.

Burnham pointed out in 1916 that C-R's may be developed in connection with posture,(22) and he has also contributed a very important discussion on the relation between the C-R and the hygiene of school children.(24) He gives many examples of everyday C-R's, and his practical suggestions for improving hygienic conditions should prove very useful. In another paper (25) Burnham suggests that "many important educational and hygienic subjects are most clearly understood and perhaps most profitably investigated from the point of view and by the method of the conditioned reflex." In this paper Burnham also gives a treatment of association and inhibition with particular reference to the child. The basic psychological phenomenon for "*The Normal Mind*" (26) by Burnham is the C-R principle. In the preface of this book Burnham states that "he is not concerned with the conditioned reflex as the basis of any theory of psychology, but recognizes it as an objective method of such significance for the study of children and mentally disordered adults that, without a knowledge of it, the mental hygiene of to-day cannot be adequately understood." He considers habits roughly as systems of conditioned reflexes: "The line of distinction between habits and conditioned reflexes is not clearly marked. Although habits are systems of conditioned reflexes, theoretically all conditioned reflexes are potential habits. Strictly, habits are conditioned reflexes at the outset." (26, p. 171) Burnham's book gives a fairly complete discussion of the relation between child psychology and the C-R principle.

Conditioned Responses in Adults. The writer carried out an experiment in which the pupillary reaction was conditioned to various external stimuli.(29) A change in the intensity of light falling on the retina was used to evoke the natural pupillary response. By ringing a bell repeatedly with a contraction of the pupil the bell itself became an adequate stimulus to cause pupillary contraction in the case of four different subjects. A dilatation of the pupil was associated to the bell stimulus in four other subjects. Another subject was trained so that his pupil would contract for a bell but dilate when a buzzing sound was made in a telephone receiver. An electric shock was also associated with a contraction of the pupil, and, later in the same subject, an association was formed between the shock and a dilatation of the pupil. Memory for these conditioned reflexes per-

sisted for only a short time. Evidence was obtained against the formation of associations in the backward direction (34) and against the view that learning is always mediated by consciousness.

In a later experiment, the writer established conditioned eyelid reflexes to a sound stimulus.(30, 31) Natural wink reflexes were evoked by the electrical stimulation method, and simultaneously with these a sound stimulus of low intensity was repeatedly given. It was found later that the sound alone would cause the eyelid reflex. The time measures of these responses indicated that the time taken for the conditioned eyelid reactions was faster than could be obtained if the subject winks voluntarily as quickly as possible. Introspections on these C-R's also showed that the subject was not conscious of winking until after he had winked. When the combined stimulation of shock and sound had been repeatedly given, it was observed that the sound had more of a speeding up and regulating effect on the eyelid reflex than at the beginning of the experiment. Further evidence was obtained against the alleged dependence of C-R's on conscious behavior. This experiment, as well as the former one on the pupillary reflex, seems to emphasize the reflex nature of the human organism, and they suggest a form of association and learning which can only be explained by postulating the C-R principle.(32, 33)

The first laboratory experiment on the C-R seems to have been carried out by Twitmyer in 1902.(153) In the course of a study of the knee-jerk reflex a bell stimulus had been repeatedly given simultaneously with a blow on the knee. During the adjustment of the apparatus for one subject it happened that the bell stimulus was given without the usual blow on the knee, and a kick of the foot took place which in all respects resembled a true reflex. Further investigation confirmed the conclusion that the knee-jerk reflex had been associated with the tap on the bell. The kinesthetic sensations resulting from this involuntary movement were the same as those caused by the more common knee-jerk reflex and the objective tracings were likewise the same.

Dodge carried out an experiment in which knee jerks and lid reflexes were evoked simultaneously a large number of times.(42) Dodge was unable to condition the knee-jerk reflex to the lid reflex stimulus. " The lid-reflex," he says, " was somewhat less refractory to experimental reconditioning. It was possible to produce a lid reflex of an approximately normal latency by a knee-jerk stimulus, after a considerable number of simultaneous excitations. Partial

cortical resystematization occurred in the memory experiments after a single repetition of the series." (42, p. 268) Cytovitch gives a brief description of an experiment on ten persons in which vasomotor reactions were conditioned to a sound stimulus.(39) The right hand was placed in the plethysmograph.

In the "*Objective Psychology*" (10, 84, 9) von Bechtereff gives a brief summary of several experiments on conditioned motor reactions. He had previously pointed out several advantages of working with conditioned motor reactions,(8) and he argues again that Pawlow's conditioned salivary reflex method is too limited in its application. Bechtereff states that "La production simultanée de deux impressions permettait de constater qu'au bout d'un certain nombre de répétitions le réflexe qui normalement ne répondait qu'á une seule, se produisait aussi en réponse a l'autre." His most typical experiment is referred to as follows: "Après un certain nombre de productions simultanées, on avait vu que le mouvement réflexe de la jambe se produisait aussi bien sur l'illumination de la lampe à incandescence ou sur la production d'une note musicale qu'en réponse au contact électrique." (10, p. 155) Bechtereff believes that these C-R's are involuntary. There is a general summary of the work which has been done in his laboratory on both motor and salivary reflexes, as well as a discussion of Pawlow's school.(10, pp. 249–267) In 1916 Bechtereff gave a special discussion of the localization of C-R's in the brain,(11) and in 1923 a discussion of cortex function by associative motor reflexes.(12)

A few months ago Bechtereff sent the writer a copy of a more recent work on reflexology, published under the new régime in Russia.(13) He seems to realize now that his earlier psychological writings were rather severe, and the new Russian book is called "*The General Principles of the Reflexology of Man, a Textbook of the Objective Biological Study of Personality.*" This work, however, shows Bechtereff more objective than ever. He says that he has now dissolved some of his former difficulties with "psychology," and does not care to use the term any longer in the title of his book. His principal interest at the present time is to establish a new science of reflexology. In the new book there is a lengthy treatment of the relation of the C-R principle to sense physiology, the psychology of learning, Freudian psychology, and personality in general. He continues to use the expression "associated reflexes" for "conditioned reflexes."

Kostyleff carried Pawlow's and Bechtereff's work on C-R's to an even higher theoretical development, and he claims that their work has provided an organic foundation for conscious behavior.(82, 83) The Russian experiments on C-R's is the point of departure for his essay on the "*Cerebral Mechanism of Thought.*" (85) Kostyleff also points out many of the limitations of Pawlow's generalizations. He is a close follower and an ardent admirer of Bechtereff's "*Objective Psychology,*" which he translated into French.

Regardless of the value of Bechtereff's theoretical assumptions, one hesitates to accept all of his experimental data on the C-R because so little is said about the experimental procedure and the reliability of the conclusions. The laboratory reports of experiments on conditioned motor reactions seem to indicate that they frequently occur in a rather halting fashion. Watson has described a technique for obtaining conditioned motor reactions in man.(156) The results obtained with a jerk of the foot to an electric shock were not as satisfactory as those obtained with a withdrawal movement of the finger. Conditioned motor reflexes were obtained in several subjects. Watson also discusses the general characteristics of C-R's and the method of using them to obtain differential reactions, suggesting that this method has some advantages over the "discrimination method" in "deaf and dumb individuals, aphasics, and dementia praecox patients of the 'shut in' type."

Hamel devised an experiment with the purpose of obtaining some evidence in support of his previous conviction that conscious factors mediate C-R's.(51) We regret to say that Hamel was not acquainted with what had already been written on the C-R. His procedure is faulty, and there are too many conclusions. He also argues that since conscious processes and C-R's are both mediated by the brain, therefore C-R's are mediated by consciousness! Some other conclusion would have been just as good. Hamel does not seem to know that some reflexes are slow, and that we may be conscious of them. The writer made several attempts to obtain C-R's with the withdrawal movement of the hand, and the objective results agree more closely with Watson (156) than with Hamel.(51) Although there are too many irregularities in this form of behavior to warrant the continued use of the term "reflex," we obtained some reactions which were not strictly "voluntary."

Wilson had ten subjects learn several series of nonsense syllables, and other subjects copied a list of letters on a typewriter.(146,

p. 112) The subjects were later tested under the same and under different conditions; and the superior performance under similar conditions was attributed to the influence of conditioning stimuli.

Various investigations have been made of the "appetite" or "psychic" secretion in man at the sight of food, which illustrate the truth of the old proverb, "Better a dinner of herbs where love is than a stalled ox and hatred therewith." Cannon gave a very suggestive discussion of this matter in 1909,(27) where reference is made to several earlier studies. The failure of Zebrowski (170) and Babkin (4) to obtain conclusive evidence for conditioned salivary reactions seems to have been due partly to faulty technique. Gley and Mendelssohn (49) failed to establish a conditioned salivary reflex in a soldier who had been wounded a short time previously in his right cheek. They found it difficult "to conceive of the production of 'conditioned reflexes' without the intervention of psychic elements." However, their attempts were brief and their patient was abnormal. Lashley made a very careful study of the human salivary reflex,(90, 91) and devised a drainage tube to collect the secretion from Stenson's duct,(90), which has since been slightly improved by Richter and Wada.(140) Lashley reports some conditioned salivary reflexes in man (90) which had been previously established. It is our opinion that it is more difficult to establish conditioned salivary reflexes in a man than in a dog because the man analyzes the situation and cannot be "deceived" so easily. Lashley also made a study of the secretion of the parotid gland in nine patients who were suffering from more or less fully developed hemiparesis or hemiplegia.(92) No conclusive evidence was found in these cases for the existence of conditioned salivary reflexes.

Miller and others have investigated the influence of various factors on the flow of gastric juice in man; (108) and contrary to the view of Carleson they found that several "psychic" factors had an influence. Pawlow says that "appetite spells gastric juice." (125) Cannon's work on the emotions suggests the possibility of establishing C-R's in the adrenal glands.(28)

The Conditioned Response and the Psychology of Learning. The first systematic treatment of the C-R principle from the standpoint of "pure" psychology was given by Smith and Guthrie.(146) These authors make use of the C-R in explaining association, various forms of learning, and imitation. An excellent discussion is also given of its relation to different forms of perception and to elementary social

reactions. Following Smith and Guthrie, Wilson criticized various forms of "trial and error" learning.(166) Hunter has a friendly attitude towards the term conditioned reflex, but believes that undue novelty has been attached to the method.(62) He uses the C-R principle in his discussion of habit formation and association learning. Givler states that the mechanism by which associations are formed is the conditioned reflex, and that the C-R principle underlies habit, memory, and thinking.(48) Humphrey discusses the C-R in a general way in connection with learning, language habits, feeling, and emotion.(61) Woodworth considers that the C-R is important in human and animal learning, and several diagrams are given to show its relation to the law of combination.(167) He speaks of the conditioned reflex as a "type of learning." Strong uses the expression "stimulus substitution" for conditioned reflex in describing the learning processes involved in committing a vocabulary to memory.(148, pp. 74–81) Dunlap applies the term "drainage" to the neural processes involved in the formation of C-R's, and points out some objections to the term conditioned reflex.(44)

McDougall takes a rather facetious attitude towards the whole idea of conditioned reflexes.(104) He says the brain is not concerned with reflexes, and that to demonstrate conditioned reflexes it will therefore be necessary to establish them in animals which have no brain. He gives the credit for elaborating reflexes and conditioned reflexes to the Englishman, Herbert Spencer. The writer has attempted to answer briefly some of Professor McDougall's statements.(35) Mursell raises objections to the C-R as an explanatory principle of learning.(113) Gates makes considerable use of the C-R, but attempts to evaporate the term in favor of the Law of Exercise.(47) Frank attempted to show in a short article that the C-R principle underlies all forms of learning.(46) Peterson answers somewhat irritably that Frank's suggestion is too simple, and that it does not account for the elimination of wrong acts.(138)

Allport describes the way the C-R mechanism operates in modifying the prepotent reflexes with which the child is endowed at birth.(1) Much experimental and observational material is given to show how the fundamental habits are formed. Allport describes the operation of the C-R in emotional experiences, language and gesture, Freudian mechanisms, and in social control. His book on "*Social Psychology*" gives the most extended application of this principle to social reactions. Humphrey has given a very clear exposition of

imitation,(57) and claims that it is "a learned reaction, consisting of activity based upon conditioned reflexes where the secondary stimulus and the reaction are identical." In a later article Humphrey uses the C-R in explaining some simple forms of social reaction.(60) He claims that habits are "chains of C-R's." The writer made some use of the C-R in attempting to show that gregariousness is not an instinct.(36) Kantor has referred favorably to the C-R in a number of articles. His discussions of reflex action (71) and affective reactions (72) show that it is not inconsistent with the organismic theory. Kuo likewise refers to the C-R in several places. He believes that behavior sets are developed through conditioned responses.(88)

Several psychologists have expressed surprise at the fact that after a C-R is established continued repetition of the conditioned stimulus weakens the connection between it and the conditioned response. This "atrophy through use" contradicts the "law of exercise" which states that practice improves. It has also been observed that in negative adaptation the intensity of the response decreases with continued repetition of the stimulus. The writer has pointed out elsewhere (37) that the data on the C-R principle and on negative adaptation harmonize with each other, and that all of this evidence contradicts the law of exercise. If we consider the stimulus and the response, the law of exercise does not seem to be a correct statement of fact. Another difficulty lies in the concept of backward association: Why do we not observe backward associations in C-R phenomena? We have argued elsewhere (34) that the backward association principle has very little scientific justification. Much confusion will be avoided if we speak of an association between a stimulus and a response, rather than an association between two stimuli. In Pawlow's experiment the bell is not associated with the meat, and the bell stimulus does not produce meat. It is associated with a salivary response.

The Conditioned Response and Abnormal Psychology. The first applications of the C-R principle to abnormal psychology can be traced definitely to Pawlow and Bechtereff.(8) In 1914, while discussing "*Neurograms,*" Prince stated that Pawlow's C-R experiments "show the possibility of linking a physiological process to a psychological process by education, and through the conservation of the association reproducing the physiological process as an act of unconscious memory." (139, p. 139) He says that in these C-R experiments also "is to be found the fundamental principle of what under

other conditions can be recognized as a *psychoneurosis—an abnormal or perverted association and memory.*" In 1916 Wells showed the close connection between von Bechtereff's C-R and affective transference, or *Übertragung.*(163) Wells has also discussed the differences between the two phenomena.(164, pp. 126–134) Kempf makes considerable use of the C-R in his treatment of affective and emotional reactions in connection with autonomic functions (79) and psychopathology.(81) He believes that the C-R mechanism is the cause of much abnormal behavior.(80) Hollingworth advanced a theory of functional neuroses in terms of the mechanism of "redintegration." (54) His objections to the C-R as an explanatory principle are stated in a few words, and an attempt is made to distinguish it from the redintegrative process. The redintegrative mechanism referred to by Hollingworth seems to be closely related to the C-R mechanism. He gives several illustrations of C-R's in support of his general argument. Heilbronner (52) described several examples of hysterical behavior in children acquired mainly by the C-R method. He believes that these habits are very common, and he gives suggestions for the treatment of children so affected.

Humphrey criticized some of the Freudian concepts and explanations from the point of view of the C-R principle. "By simultaneous concurrence," he writes in one article, "there are set up systems of interconnected conditioned reflexes, the reaction to the combined stimuli of which constitutes the Freudian wish." (56) In another article Humphrey attempts to bring the Freudian mechanisms under the C-R rule.(58) A third article is critical of Lay's "*The Child's Unconscious Mind*" from the same angle.(59) Burnham has discussed the relation of the C-R to psychoanalysis and pathology.(25) Allport gives a careful treatment of the relation between Freudian psychology and the C-R on the social side.(1) Lashley makes use of the C-R in his physiological analysis of the libido.(94) Smith and Guthrie have shown that exhibitionism is learned partly by means of the C-R mechanism.(147)

The Physical Basis of the Conditioned Response. Several researches on neurobiotaxis seem to indicate that one of the laws governing the growth of nervous processes is practically the same as the law of contiguity and identical with the C-R principle. Kappers has observed that the selectivity of tract formation depends upon simultaneous or correlative stimulation.(74, 19, 73, 76) In another discussion (75, p. 53) he says that "simultaneous irritations,

which repeatedly penetrate into the nervous system in different places, cause in this nervous system a neurotic association or associative integration between the centers where they arrive. This law is for the material development of the nervous system the same as what we have known for centuries as the law of association in our conscious conceptions (though it was discovered independently of it, without any psychological afterthought)." In 1921 Kappers gave a further discussion of the structural laws of the nervous system and the principles of neurobiotaxis, together with a fairly complete bibliography.(77) Black (16) has followed up some of Kappers' work; and Burnham has pointed out the connection between the C-R and the neurological work of Kappers and Bok.(23) Johnson has discussed the C-R in connection with the physiology of cerebration.(67) The writer attempted a physico-chemical explanation of association and learning as observed in C-R experiments.(33)

After reading the literature on the conditioned response one comes away with a feeling that it is probably *the* method by which habits are formed. But after considering the complexity of mental life and the numerous factors which must contribute to our acquired activities, the conditioned reflex seems to be too simple an explanation to cover the whole field. It is probable that in attempting to clarify the issues involved, several writers have placed too much emphasis on certain concrete phases such as the stimulus and the response. There are many other factors to be considered, and many other problems to be solved. And yet, when an association is formed between salivary secretion in a dog and the sound of a bell, neither the law of exercise, the law of effect, nor "trial and error" is adequate to give a satisfactory explanation. The conditioned reflex principle itself has a definiteness and plausibility which the other theories of learning do not possess.

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SPECIAL REVIEWS

HALL, G. STANLEY. *Life and Confessions of a Psychologist.* New York: Appleton, 1923. Pp. ix+623.

Psychologists will find a peculiar interest in this autobiography of one of the pioneers of the science in America. Organizer of the laboratories at Hopkins and Clark Universities, founder of the first psychological periodical in this country, one of the triumvirate which launched the American Psychological Association, the late Stanley Hall has been an outstanding figure among us for more than forty years. Much of his life is a matter of common knowledge, but we are fortunate to have this more complete and intimate record in his own words.

The title of the book is perhaps not exact. It contains very little which could appropriately be called "confessions" in either sense of the word. But it does give an objective account of the author's career and throws light on some of his guiding motives. The history of Clark University, with its many trials and vicissitudes, is told for the first time, we believe, from President Hall's own standpoint. And this account may explain some of the inconsistencies which have been attributed to him in handling the difficult problems with which he was confronted. In fact, the author tells us that his chief motive in undertaking the work was to clear up this episode.

The book opens with a detailed account of Hall's family and ancestry, written in narrative form but containing a fairly critical appraisal which will interest the student of heredity. A long chapter is devoted to the author's childhood and boyhood, followed by a briefer account of his secondary education and college life, and of his student years in Germany. Hall's experiences at Hopkins and Clark complete the historical part of the book. The remaining chapters deal with the author's personal characteristics and with the development of psychology in his time, including an outline of his attitude toward the science.

What we miss in the volume is a critical self-analysis—a study of motives and aspirations, such as one finds in Franklin and Rousseau—not to mention Baskirtseff and other lesser self-explorers. And this raises the question whether any one is really capable of frank self-

revelation to the world at large during his own lifetime. The irresistible tendency to rationalize our own actions is now generally recognized; is there not also a similar tendency to "ethicize" our life history? No American psychologist has championed the psychoanalytic method more zealously than Stanley Hall. Why then did he, a trained introspector, let pass this excellent opportunity to give to the world his inner life history? Undoubtedly, he realized that one's repressions are too strong to tell the truth candidly, and his literary honesty forbade him to "ethicize" the story in the way that earlier confessors have been suspected of doing.

In the last chapter there is an approach to self-revelation. On pages 573–580 Hall discusses several personal traits with unusual frankness, and in many places his religious development is touched upon. In the chapter on Childhood there is a frank discussion of the phenomena of puberty; this, however, is rather a study of his environment than of his own mental growth.

In connection with this book one should read the author's *Recreations of a Psychologist,* some parts of which teem with personality. And we may hope that the lamented author's recent death will release portions of his original manuscripts which proved too intimate for publication during his lifetime.

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HENNING, HANS. *Psychologische Methoden zur Untersuchung des Geschmachsinns. Abderhalden's Handbuch der biologischen Arbeitsmethoden.* Abt. VI, Teil A, Heft 4. Berlin and Vienna: 1922. Pp. 627–740.

HENNING, HANS. *Der Geruch.* Ein Handbuch für die Gebiete der Psychologie, Physiologie, Botanik, Chemie, Physik, Neurologie, Ethnologie, Sprachwissenschaft, Literatur, Aesthetik und Kulturgeschichte. Leipzig: 1924. Pp. vi+434.

One marvels that, despite the well-known difficulties under which the scientist and his publisher have been forced to labor in modern Germany, works of the kind before us are nevertheless written and printed. The Abderhalden undertaking is one of extravagant proportions into which Henning's monograph finds its place as one of many treatises which, when complete, will embrace the full range of psychological methods, both pure and applied. As for the handbook on Smell, it is, as its subtitle indicates, encyclopaedic in scope. Although appearing nominally as a second and revised edition of a

previous volume bearing the same title (1916), the author informs us that the new book contains scarce a paragraph in common with the old one.

To give a detailed review of these two works would overtax the space at my disposal. I shall therefore confine myself to a somewhat general consideration of Henning's researches and their systematic setting. Regarding the main facts, psychologists are already familiar with Henning's classification of taste with reference to a tetrahedron upon which *sweet, sour, bitter,* and *salt* form the turning points of an otherwise continuous series of qualities; the intermediates, like those of the color-series, being of equal simplicity with the four principal tastes. Thus *alkaline* is a simple taste between *sweet* and *sour,* while the metallic taste, with somewhat less assurance, is placed between *sour, bitter,* and *sweet,* or between two of these and *salty.* As for insipid tastes, these are not tastes at all, but are referred to a tactual impression. Likewise in smell we have the prism with its six turning points of *spicy, flowery, fruity, resinous, putrid,* and *burning* odors.

Experience shows that a mixture of two tastes or two odors is not identical with the simple intermediate which lies between these two. Apparently there are all degrees of intermixture, combination, fusion, and simplicity, upon which only experience can decide. For instance, in taste Henning informs us that the four psychophysically basic processes may operate (1) singly, (2) in groups of a uniform physiological fusion, and (3) in groups that run more or less independently of one another. Thus if but one process is present, such as that of sugar, we experience simple sweetness. If two processes are coupled and physiologically fused as partial processes (such as the salty and bitter processes of chloride of magnesium) we experience a simple transitional taste with several similarities or sensory aspects (bitter-salty). But if two of these processes occur with a certain oppositional independence (cooking salt and cane-sugar mixed), we experience a more or less intimately mixed taste (sweet-salty), the components of which can be analyzed.

Henning's account of all such analyses is bound up with the doctrine of *residua* (G. E. Müller) or *engrammes;* without a central residual process of past experience the observer is unable to apprehend any sensation at all, and is "mentally blind." Henning adheres to the association-psychology "which since Aristotle and Hume has proved a sound basis wherever it has not been senselessly overladen." While this is not the place to discuss this much disputed

doctrine, it is nevertheless important for an understanding of Henning's interpretations to realize that a lack of clear-cut phenomenological descriptions is attributable, perhaps, to his implicit faith in attention as the simple—though itself unexplained—function, whereby the most diverse contents of consciousness can be analyzed.

In the genetic and ethnological portions of the Handbook on Smell, Henning relies upon the "complex-quality" of a "collective apprehension" (Müller) as the key to primitive experience; and in both taste and smell he finds original data largely unspoiled by the analytic and abstractive methods which have raised the "higher" senses to the discriminative level they now enjoy. Thus he opens his account with a statement that "for many sciences, in the beginning was smell." Not only does the complex quality of odor, as well as the nature of its employment by animals, reveal this lower level of apprehension which in primitive man extends to all experiences—so that "outer" and "inner" world constitute for him a single fused unit—but the seat of smell in the olfactory lobes points to its ancient origin as being the first sensory quality to arise with the development of the "new" brain. In addition to being the central organ of smell, these lobes also control sex, procreation, nourishment, and excretion; accordingly, even now, smell possesses its intimate connection with these fundamental processes of life.

A further proof of the primitive character of both taste and smell is found in the imagery of these senses which is always of the "eidetic" type demonstrated by Jaensch and his co-workers as the matrix of all reflective experience. In turn, the eidetic image depends upon an *Urbild* which allows of no distinction whatever between presentation and reflection. Eidetic imagery includes, then, the potential data of after-images, images of memory, and images of imagination. As distinct from any of these later forms of reflection, the eidetic image includes a sense of self, fully projected into its content, and possesses a reality by reason of its close connection with perception. Although not identical with what we call hallucination, the eidetic image indicates a transition between it and perception.

Between the ages of four and twelve the experience of a child undergoes a transformation in which the eidetic imagery splits up into after-images and ideas, over against which the self is made to stand as observer. This transformation is chiefly effected by modes of apprehension; in general, interesting objects retain their eidetic character longer than do uninteresting objects. A red object

may be experimentally repeated in a child's experience until, through weariness, he suddenly, and for the first time, experiences to his vast astonishment a green after-image.

According to Henning, images of taste and smell always remain eidetic; thus lacking the differential remoteness of signs and symbols which derive from the higher sense.

The stimuli of taste are particles dissolved in a liquid solution, while those of smell are vaporizing particles dissolved in air. Liquids have no odor, and the fact that water-animals smell is attributable to a difference in the constitution of their sense-organs. Henning can find no adequate grounds for the assumption of an original " chemical sense " such as has been proposed by G. H. Parker.

While the exact chemistry of neither taste nor smell stimuli is as yet certain, it appears that atomic grouping and the constitutional character of a chemical are essential features, rather than the atomic or ionic ingredients, as such. In taste, we are told that the different series, salty to bitter, salty to sweet, sweet to bitter, etc., always repeat certain inorganic chemical constellations, either in the sense of the periodic law, or of certain groupings of ions. In smell, olfactory elements are found in the fourth, fifth, sixth, and seventh groups of the periodic system, though not all members of these groups give odor, nor do all combinations containing these elements. Consequently, the elements themselves can only be regarded as " radicals " to which a certain atomic grouping or a chemical constitution must be added.

For the most part, the elements themselves are odorless; the exceptions being fluorine, chlorine, bromine, and iodine. Since the same odor is often obtained from different chemical classes which have a like combination of osmophoric groups, it is apparent that the form of constitution is more significant than the elemental ingredients.

As regards mode of stimulation, taste seems to go with ionization, while smell is referred to a colloid-chemical process of adsorption. The intensity of smell varies directly with the nature of the solution of vaporized air particles, and increases in proportions which accord with the Weber-Fechner law. In addition to experienced intensity, smell also possesses an objective force determined by physico-chemical conditions. The stimulus of smell is not the sum of the odoriferous particles, but the number of these vaporizing in the nose and available to the sense organs.

Phenomenologically, a complex which is a uniform whole possesses properties and effects which cannot be derived from the properties and effects of its separate constituents. Primitive complexes contain the ego as an active participant within the complex itself; consequently all flows together, as instanced in magical and eidetic phenomena. Although the adult mind distinguishes a *given* or " subjective " odor from an *object-odor,* the former is an artificial result of analysis, whereas the latter is an original mode of total experience characteristic of the primitive mind, involving as it does both the participation of the ego and many other senses beside smell. Thus object-odors associate readily and without effort with other modes of experience, and one finds no generative competition or inhibition in their recall. *Given* or " subjective " odors, on the other hand, associate less readily with one another and with other modes of experience. The experience of youth is peculiarly rich in object-odors which are readily recalled, when not too persistently searched for, and which lend color and reality to the recollections of youth. The eidetic character of these images explains the futility of special effort in their reproduction, and likewise throws light upon the nature of the psychoanalytic method of revival. Parenthetically, it may also be remarked that Henning regards the eidetic image as the associational vehicle whereby the conditioned reflex operates.

The sense of smell depends so largely upon the active participation of other senses, especially vision, that a characteristic odor may fade and vanish in the dark, and experienced wine tasters are unable to distinguish red wine from white when blindfolded.

The complex quality is not merely formal and affective, but is often diversely sensory. Thus, analogies so readily drawn from sense to sense—dull odors, dull tones, dull colors; stinging odors, sharp tones, blinding colors; the universal characterizations of hard and soft, warm and cold, clear and unclear, simple and compound, rich and empty, etc., etc.—can often be referred to identical sensory constituents of the complex other than those that give it its name. This fact, however, does not preclude the possibility that residual effects and affective conditions may also be involved.

Another difficulty attaching to the analysis of taste and smell is the complete fusion of these percepts with eidetic imagery, which may modify the complex profoundly without the possibility of recourse to the abstract methods of analysis available in sight and hearing. Precise analysis, however, is aided in both senses by the distinctions that

can be drawn: in taste, between *monoglottic* fusion, when but a single region of the tongue is involved; *dichoglottic* combination, when two separate zones each furnishes a different taste; and *diglottic* mixture, when two separate zones each responds with the same taste; likewise, in smell, where we have *monorhinal, dichorhinal,* and *dirhinal* odors.

An important factor in the fusion of taste and smell is *nasal smell,* which constitutes a twelfth sense provided for by a distinct sense organ in the nose. The peculiarity of this sense is that it reacts to gases, whereas the tongue reacts only to liquids. Accordingly, substances bitter to the tongue may be sweet or sour to the nose; for instance, the natural oils of blossoms and fruit peel. A salty smell is less frequent and less intensive than the other three qualities of taste. The fusion of smell with nasal taste is not only different, but is much more intimate than the fusion of smell with taste in the mouth.

The fatigue of smell is shown to be a complicated affair, involving attention, mental fatigue, peripheral nerve fatigue, end-organ fatigue, and nasal taste. Complete compensation is denied to both taste and smell; weak impressions, however, may become subliminal through the influence of central factors.

The elementary simplicity of a smell is determinable only by experience; whenever different parts can be discerned we have multiplicity. A chemical combination like that of cologne-water may arouse either a simple or a multiple odor, whereas a chemical simple can arouse only an elementary experience. Whenever an objective mixture appears simple we are inclined to speak of fusion; but whether this is to be understood as a resultant of two psychophysical stimulations, or as a phenomenal fusion of two odors into one, is an open question. All object-odors fuse; but with "given" odors those of a similar quality fuse most readily.

This review is but a fragmentary sampling of Henning's two works and leaves out of account many interesting discussions of folklore, the esthetics of odors, the botany of smell, the evidence brought for "mixed feelings" and the reproduction of affects, the behavior of animals to smell, etc.; but perhaps enough has been recorded to whet the appetite of the reader to go directly to the Handbook for its rich store of psychological materials.

R. M. Ogden

Cornell University

OGDEN, R. M. *Hearing.* New York: Harcourt, Brace, 1924. Pp. ix+351.

Of making many textbooks of psychology there is no end; but of writing treatises which deal competently and critically with special fields of general psychology there is all too little. It is therefore gratifying to find a psychologist like Ogden devoting his energies and talents to bringing order out of the mass of literature in a field where he is a recognized authority. It is also gratifying to find a psychologist who is willing "to select those facts which appeared the more significant and trustworthy, and then allow them to fall into their own system of organization." One has the comfortable feeling that the author is not distributing his emphasis by way of inclusion and exclusion in order that he may make the facts fit some particular theory or point of view. The conclusions follow not from premises of the author's own choosing but from a critical sifting and weighing of evidence furnished for the most part by experimental data; and they are put forward not after the manner too often common to the art of the dialectician, but rather with the attitude of the true scientist who is ever ready to amend conclusions as soon as new research warrants.

Ogden does not address his book to psychologists alone. There is nothing on the title page, in fact, which would indicate that the subject is handled primarily from a psychological point of view. Although "unable to avoid the terminology and the attitude which a student of psychology is apt to adopt," the author would be gratified "if the teacher, the musician, the linguist, and the medical practitioner—especially if he be an otologist—could each find something to help him in the solution of his special problems." He might have added that the psychological terminology and attitude adopted derive to some extent from *Gestaltpsychologie* with such modifications as are required by adherence to the conviction that some sort of introspective analysis into simple attributes should be made of phenomenological configurations.

The factual material which forms the basis of the present volume is gathered chiefly from experimental and theoretical investigations of the psychology of hearing, a subject which the author has followed closely during the last two decades. The author has not been content, however, to confine himself to the more immediate implications of these studies, but has pursued their ramifications into the more complicated domains of music and pedagogy. The clarity and good

logic with which he has confronted these latter intricate problems constitute a big step in advance along that path which Helmholtz started upon but which he himself, as he tells us in the closing paragraph of his monumental work on the same subject, preferred not to follow.

The first two chapters deal with the physical properties of sound, the physiology of hearing, and typical theories which have been advanced in explanation of the facts of auditory sensation. Chapters III to VII, inclusive, are of especial interest and importance to students of general and experimental psychology. There is a detailed and admirable treatment of the elementary aspects of auditory experience. Ogden approaches this topic by dividing auditory perception into three parts: tonal, vocal, and noisy. This division is made on the basis of the degree to which the simple attributes enter into each type of percept. The percepts are all describable in terms of five attributes: pitch, brightness, intensity, duration, and volume. *Brightness* is that quality of tone by which we note that high tones are intrinsically sharp or piercing and low tones dull or blunt. Abraham's work with the siren has demonstrated that a modification of wave-length without a corresponding modification in frequency is a condition under which brightness varies independently of pitch. Rich's experiments on *volume* furnish ample evidence of the independent variability of that aspect of auditory experience which is referred to when we speak of the massiveness or extensity of a tone. Ogden rejects tonality and vocality as elementary aspects of auditory perception inasmuch as they involve either relations between tones or integrations of other attributes over indefinite pitch-regions. With the aid of these five simple attributes, then, especially pitch, brightness, and volume, Ogden is able to differentiate and characterize the three percepts: tone, vocable, and noise. A thorough examination is made of the numerous studies of vocables, and fourteen pages of valuable and most welcome material are devoted to that topic which is passed over so quietly and summarily in textbooks and classrooms, viz., noise. "The clear emergence of a pitch-salient, commanding and subordinating all other salients that may be present in the sound-mass, is the characteristic of tone. Lack of such a predominance, in a complex sound, through lack of order and a regular subordination of the salients of pitch, together with a rough dullness or a sharp brightness occasioned by an asymmetry of the sound-wave, is the characteristic of noise. The vocalic formants seem to occupy a mid-

dle ground, for while a certain regularity is indicated among the several components of a vocable, the formants lack saliency of pitch, although they appear to possess the smoothness of a tone rather than the roughness of noise."

After pointing out the weaknesses, as well as the strong points, in various theories of auditory fusion (Helmholtz, Krüger, Lipps, Stumpf, Watt) Ogden develops his own conception of an harmonic theory of fusion according to which certain unique integrations of tones, notably the octave, fifth, fourth, and to lesser extent the sixths and thirds, are accounted for biologically by reference to ingrained dispositional tendencies, both innate and acquired. It so happens that these unique integrations or fusing intervals are the very ones that are most conspicuous among the partials of a clang. Frequent exposure to these intervals in the "harmonic chord of nature" has resulted in a selective adaptation of the auditory mechanism so that the experiences are brought to consciousness as compulsory unities which must be accepted as such. Fusions, tones, noises, and vocables are all more or less compulsory percepts. It is only by a process of refined observational abstraction that we arrive at a knowledge of the integrating attributes which condition the different characters of these percepts.

Among the principles of tonality Ogden lays particular stress on the law of equal intervals as furnishing the clue to the formation of musical scales (Chapters VII and VIII). Certain intervals are "given" naturally in the phenomena of fusion; other intervals, especially those which operate in sequences of tones, derive from a unique ability to apprehend readily equal proportions of volumic differences. A study of scales reveals the fact that the sequences of tones which go to make up the scales are limited at the extremes by harmonic or fused intervals, but that in many scales there occur between the limits bounded by the harmonic interval intermediate interval-divisions which do not comply with the conditions of an harmonic series. To account for these nonharmonic divisions Ogden makes use of the above principle of equal intervals at the basis of which lies the capacity for estimating volumic proportions. Since this principle plays such an important part in the author's treatment of tonality and music it would have been well, so it seems to the reviewer at any rate, had he given a more detailed and explicit account of the grounds on which he bases his conclusion that volume rather than pitch is the determining factor in the estimation of interval-differences.

Chapter IX takes up the problem of language and indicates the manner in which the simple attributes enter into the formations of the sounds of speech, and the program which future research should follow in this field. Chapter X introduces the reader to the methods by which the elements of the art of music may be subjected to scientific analysis. The principles of music derive largely from the laws of auditory sense perception discussed in earlier chapters, and the laws of the tonic, cadence, falling inflection, return, and equal intervals, which govern the phenomena of tonality. In the melodic structures of the music of the East the principle of equal intervals seems paramount, whereas in the musical structures of the West the principle of harmony assumes greater importance on account of the practice of building up chords, even in counterpoint, which are concordant in effect. The author shows how concordance varies with the attitude of the listener, and devotes an interesting section to a discussion of the reasonableness of certain of the attempts of ultra-modernists to free music from some of its fetters. Music is more flexible and more capable of fine gradations of expression than the other arts because its reference is not primarily to the objects and common sense meanings of the world about us but rather to the unique beauties which characterize the infinite variety of patterns and formations into which its own contents may be shaped.

In the chapter on the localization of sound (XI) Ogden cites the experimental evidence by which we are enabled to say that the perception of the direction of sound is conditioned by differences in phase, time, and intensity, but insists that a psychological theory of localization cannot be expressed in terms of the bare facts of uniform correlation between physical conditions and judgment. There must be some phenomenological criterion for localization registered in the sound as heard. Ogden is inclined to infer that this criterion is brightness, or perhaps volume, or a combination of both.

The principal defects of hearing are reviewed in Chapter XII. The last chapter is an excellent presentation of the relation which the science of hearing bears to the problems involved in linguistic and musical education. It cannot be too highly recommended to those interested in these matters. In it are discussed the benefits which would accrue to the teaching of language and music if those responsible for such instruction would only direct the attention of pupils to the fascinations and beauties of sounds themselves instead of

always to the practical use to which sounds are put in language and to the formal technicalities and rules of music.

Ogden's work will undobtedly find readers who approach the subject of sound from various angles and interests. But since the book will probably appeal most strongly to psychologists, one wonders whether the author could not have added to the interest and clarity of exposition of the text, as far as psychologists are concerned, by stating his own general point of view regarding mental phenomena. This could have been done without necessarily prejudging the interpretation of the data dealt with, and would have made more obvious in places (*e.g.*, pp. 268ff.) the reasons for some of the author's conclusions. The book is provided with a good index and a valuable list of 150 references to literature on audition.

HARVARD UNIVERSITY CARROLL C. PRATT

PEAR, T. H. *Remembering and Forgetting.* New York: Dutton, 1922. Pp. xii+242.

The somewhat agglomerate nature of this book is accounted for, in part at least, by its development from a course of lectures to army medical officers on the subject of remembering and forgetting, and the addition to this of various related material. "The interest of the general reader has been kept in mind" (rather darkly at times), but the student of psychology will find many suggestions and much profit here. The author, who is professor of psychology in the University of Manchester, had for his object a guidebook rather than a textbook, and the result is very human and readable.

The subject of imagery is discussed in several chapters, and its selective nature is emphasized. Dr. Mabel R. Fernald's "The Diagnosis of Mental Imagery" (*Psychol. Rev. Monog. Sup.*, No. 58) is deservedly commended. Professor Pear does not believe that pure types (visual, auditory, motor, etc.) exist practically, but he does not approve of the dismissal of important differences as merely "mixed." "It is usual for an individual to possess one sense-sphere the imagery of which is predominant over that from the others" (p. 23). The author stresses the common inability of one type to appreciate another and, although a visualizer himself, pays particular attention to kinesthesis. After presenting the opposing views of Washburn and Titchener on kinesthetic imagery (the former holds that such images are in reality sensations based on slight muscular movements), he leaves open the question of its existence; but he adds a very inter-

esting chapter in the appendix on "The Intellectual Respectability of Muscular Skill," which contains a plea and suggestions for the development of a kinesthetic language.

A chapter is devoted to "The Percept and the Image," and then follows "The Functions of the Image." "The chief function of imagery seems to be the conveyance of a meaning" (p. 44), and the author agrees with Dr. Schiller that the latter is "essentially progressive" and personal. "The image plus its meaning is nowadays generally known as the idea" (p. 48). Professor Pear cautiously subscribes to the belief that imageless awareness may occur, particularly in the case of abstract thinkers, and this leads him again to discuss the psychological nature of meaning, which he regards as "the consciousness which occurs in connection with adapted behavior, overt or incipient, explicit or implicit" (p. 62). Professor Margaret F. Washburn's theory of the relation between meaning and felt movement is referred to with approval. In considering the relative independence of image and meaning, the author, although not at all averse to introspection, sees in the dream structure the clearest support. Certain of his examples, however, are none too obvious (pp. 51, 52).

The consideration of dreams occupies more than one-third of the book proper. "Usually—perhaps always—the dream is composed of recalled experience. It can therefore be included among the phenomena of memory. While all memory is selective, the dream usually exhibits the results of this picking and choosing in a pronounced form" (p. 107). Here Professor Pear pursues further his study of the relation between image and meaning, and the allied problem of mental control. The views of Freud and of Rivers are presented and discussed, and the author includes an analysis of one of his own dreams.

In the long and interesting chapter, "How We Forget," Freud and Rivers are again given major attention, and the theories of the latter on suppression and repression are described. Professor Pear presents (p. 166) the following provisional classification of forgotten experiences:

1. Embodied
   - (a) Apparently insignificant.
   - (b) Significant, but completely congruous with the personality.
2. Exiled.
3. Superseded.

The term "embodied" is preferred to the "fused" of Rivers, and "exiled" comprises repressed experiences, while "superseded" is used in a sense similar to "retired," our "dead selves." The author realizes the possibility that repression may account for these "superseded" memories, but he thinks of them as "seldom invited to enter" consciousness rather than as expelled therefrom.

The book concludes with an appendix in which, besides the chapter on kinesthesis previously referred to, there are chapters on "Synaesthesia," "Number-Forms," and a brief account of the neurological work of Head and Rivers and its relation to imagery.

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Werner, Heinz. *Die Ursprünge des Lyrik.* Münich: Reinhardt, 1924.

In the treatment of the problem of the esthetic the fact of our loss of a clear orientation comes home to us.

The present study in esthetic origins shows the point of view and the method of Wundt's *Vergleichende Psychologie,* which endeavored to reconstitute the "psychical life" of animals, of children, and of primitive and extinct peoples and cultures. This objective, thus stated, has receded, for us, into the background and new objectives have not yet clearly emerged. The service of the present work—which, the author tells us, has lain practically complete since the close of the late war—may then lie in the fact that it leads us to a scrutiny of the objective and of the method.

To define the objective of an *Entwickelungspsychologie der Künste* is a big order if one desires clearness of conception, requiring, as it does, besides definition of the mooted psychical, also that of evolution and of the esthetic. The conception of evolution is under criticism on other grounds than those put forth by reactionary theological fundamentalists; and an unambiguous definition of the nature of the esthetic has never been aggressively promulgated.

Werner takes the products of one field of esthetic activity, viz., poetry, and seeks its origins in preësthetic, "esthetoid," activities, somewhat after the manner in which the biologist seeks the descent of *homo sapiens* from "anthropoid" forms. This type of objective is familiar enough, though it may be that the zest for it has become somewhat dulled in these *post-bellum* days.

As to Werner's method, we said that that showed the traces of the Wundtian influence. The origin of the lyrical, *i.e.,* of poetry, in

the " primitive " psyche is to be discovered by the application of the comparative formula, that is, primitive behavior and its products are to be " psychologized."

This psychologizing reveals the fundamental motives that give rise to the " esthetoid " and eventually, in a modified form, to the esthetic activities. The " esthetoid " activities, Werner thinks, fall into two groups: (1) the " meaningless " activities that have their rise in reflex motor discharge of pleasantly toned states, and may take the form of nonsense rhymes in the field of poetry or of jazz in the realms of music and the dance; (2) the " meaningful " activities that have their source in " balked " desire—always unpleasant—as in hunger and love, in grief over the departed dead, and in the anger arising when one's wishes have been crossed. It is these activities of the preësthetic stage that furnish the *content* upon which the esthetic activity operates.

The hypothesis that emerges is familiar enough. The " original " activities having been held up, their part-contents, whether stimulus-object, reaction-tendency, or emotional processes, may become the subject of attention in the specifically differentiated esthetic attitude or *einstellung*. In so far forth the " original " purpose has been modified. The esthetic envisagement is the final term of an evolutionary process in which the natural objectives are voided. One is reminded of Santayana's application of this sort of hypothesis to the religious life. It there similarly voids the objectives of that life by negating them intellectually and then gives to the erstwhile faithful a substitute: " Your religious beliefs must not seek rational justification; it is their function to give esthetic satisfaction."

Two criticisms suggest themselves. One is a question of fact. The " meaningful " activities that may furnish occasion also for the operation of the esthetic attitude are not necessarily of the unpleasant variety. The songs of the chase, of love and war, and of death, tell of achievement as well as of failure; they bespeak hope as well as despair. The other criticism can be merely indicated. Werner operates with the conception of " evolution " after a manner not more loose than that of many others who bring it before the public in these latter days as something to be " accepted " as a matter of course. But the lack of clear-cut definition of the concept and its implications, whenever that lack occurs, tends, in the opinion of the reviewer, to give us a pseudo-science that in its dogmatism may be stultifying.

UNIVERSITY OF ILLINOIS CARL RAHN

SPEARMAN, C. S. *The Nature of "Intelligence" and the Principles of Cognition.* London and N. Y.: Macmillan, 1923. Pp. vii+358.

The instructed psychologist, if pressed for time, may obtain the essentials of the author's program by beginning with Spearman's own excellent Summary, following this with Part II. But he will thus miss one of the best critical surveys of the state of modern psychology with which the reviewer is familiar (Part I) and the best evidence for the fruitfulness of Spearman's proposed principles (Part III).

Despite all the efforts of mental testers, the meaning of "intelligence" eludes us for the simple reason that the term does not at present possess a definite meaning. Nor can we give it a settled meaning which will be satisfactory until we have placed it in respect to other aspects of cognition. But when we turn to cognition, we find the same deplorable lack of ultimate laws of which James complained three decades ago. We have, to be sure, in the works of leading psychologists, "many deep thoughts and much felicitous language." But psychology has never succeeded, as more progressive sciences have, in rendering the best of the older men obsolete. Even the triumphs of experimental psychology "attain to the dimensions of splendid raids rather than to those of consolidated conquest." Generalizations we have but no pregnant system of principles like those with which Newton invested physics. Spearman does not shy off from the implied comparison; with proper modesty, he would do for psychology, or at least for cognition, what Newton did for mechanics.

Knowing is an act which may or may not supervene upon that "lived" or enjoyed experience which forms its basis or provides its material or content. But since knowing (as well as conative) acts are themselves experiences, we have two kinds of experience: the one kind consists of mental states or affections, that is to say, sensations and feelings; the other of cognitive and conative acts. Since any experience may be cognized, it is clear that we may know our own knowing—the obvious basis of introspection in the cognitive field. But the primary kind of experience is, of course, sentience.

There are three "qualitative" laws which prescribe the nature of cognition. Supplementing, almost, we may say, limiting, these are five "quantitative" laws which determine the relative "intensity" of the cognition prescribed by the three qualitative laws. Correspond-

ing to the qualitative laws, there are three kinds of acts giving rise to knowledge. The basic one is *apprehension.* "Any lived experience," runs the first cognitive principle, "tends to evoke immediately a knowing of its direct attributes and its experiencer."

But knowledge is not limited to apprehension. For between two characters of experience (or between two experiences) we may know *relations.* These are drawn out or *educed* from the nature of the characters as presented. For the eduction of relations, the characters must be cognized; merely lived experience will not suffice though the relation may be much more clearly cognized than its "fundaments." The second principle of cognition reads thus: "The presenting of any two or more characters tends to evoke immediately a knowing of relation between them."

The third cognitive process has frequently been confused with the second. It runs: "The presentation of any character together with a relation tends to evoke immediately a knowing of the correlative character." It is clear that there is some justification for the prevalent identification of this process with the evocation of relations. The final cognitive result is the same: two apprehended characters standing in a cognized relation, one to the other. But in one case we begin with the two characters and educe the relation; in the other we begin with one character and a determinate relation and educe the character which stands in that relation with the first.

The three qualitative principles Spearman calls "noegenetic." They possess both noetic and generative virtue. "By noetic is meant any cognitive transition that is valid self-evidently. By generative is meant any bringing of an item into awareness by a process which does not postulate its having been there before. These two virtues, noetic and generative, would appear to be inseparable."

To a fuller consideration of the five "quantitative principles," Spearman proposes to give much space in a forthcoming book on mental tests; they are accordingly dealt with more briefly than the noegenetic principles, which are in any case regarded as more definitively established. The five "quantitative" principles are those of mental energy, retentivity (inertia, facilitation, association), fatigue, conative control, primordial potency.

The total mental energy tends to remain constant, at least as regards the cognitive output. We have here, obviously, Spearman's well known general factor, *g,* the underlying basis in all mental tests. But this principle is also intended to cover many of the phenomena of the range of consciousness and attention.

Retentivity is considered as a principle that extends to mental processes of all sorts and even governs an immense number of purely physical events. The range for psychology extends from the lag of sensation, through perseveration, to facilitation by repetition and association.

Fatigue is recognized as a principle working in opposition to the last one. Spearman does no more than indicate the direction of a number of problems which occur in this connection.

"The intensity of cognition may be controlled by conation." Here again we have a principle which covers some of the manifestations of what has been called attention, more particularly voluntary attention. Spearman, though his own study is devoted to cognition, regards conation as the more fundamental aspect of mental life. This fourth cognitive principle is the nexus by which conation is brought into its relation with cognition. "This principle brings to simple scientific expression, and therefore prepares for exact scientific investigation, the main facts furnishing the bases of the theories of Freud and Jung." It is in this connection, we may add, that the doctrine of the sentiments as worked out by Shand and McDougall would have to be considered.

Finally, the degree of any particular cognitive process is determined by certain primordial potencies; these vary from individual to individual, and in each individual they are of unequal strength *inter se*. These primordial potencies will be recognized as the special factors, *s*, which combine with the general factor, *g*, in determining the mental test score. (The relation of the three intervening quantitative principles to the test score will be worked out in greater detail in the forthcoming book; although they are general factors, only occasionally do they materially affect the test score as do *g* and *s*.)

These five quantitative principles do not correspond to cognitive processes but they bring about three processes by joint action. These three processes are *reproduction, disparition,* and *clearness-variation.* These three "anoegenetic" processes, together with the three noegenetic processes which correspond to the first three qualitative principles, exhaust the whole domain of cognitive activity.

We have spoken as if degree of cognition were a term of self-evident meaning. Such is not, of course, the case. In an interesting chapter (Chapter XI) Spearman considers in what the growth of cognition consists. On experimental grounds, he breaks up clearness into two processes of intensification and determination, the latter

giving rise to or rather affording scope for differentiation. The apprehension of experience (the primary cognitive process) is not greatly impeded by indeterminateness; "one may be quite sharply aware of thinking unsharply." But eduction, whether of relations or of correlates, is hindered greatly by the indeterminateness of their fundaments, that is, by the indeterminateness with which the characters involved are cognized.

With regard to the other constituent of clearness, the situation is curiously inverted: when the intensity becomes very low, the power of experiential apprehension or introspection rapidly declines, while the power of eduction remains little affected. "In this way it comes about that a cognitive item of low intensity [it must be remembered that Spearman does not mean sensory intensity but something like the *Bewusstseinsgrad*] can be very 'clear' in the sense of intrinsically determinate and eductively effective, and nevertheless at the same time very 'unclear' in the sense of unamenable to introspective apprehension." Experience which is thus unamenable to apprehension is "subconscious." Where the subconscious experience is of the sentient order, we have anoetic sentience. Something which closely approaches this as a limit, Spearman thinks may be experimentally induced. But we may have subconscious experience which is noetic and even "noegenetic" since it may give rise to the second and third cognitive processes. The determining tendencies and sets, not to mention the complexes of the psychoanalyst, are subconscious experiences of this sort.

Criticism may be begun at this point and concerns itself first with the matter of terminology which Spearman himself insists is vitally important. This use of the term subconscious seems to the reviewer inconsistent and unfortunate. Doubtless it concurs with a large body of current usage, but current usage is here in a hopeless mess. Of the two main significations which the word consciousness has had—the awareness of experience or the experience itself—Spearman adopts the latter as now ineradicable in our modern vocabulary. Yet confusion constantly arises because of a certain persistence of the older meaning. Now Spearman proposes to use subconsciousness to suggest this older meaning of consciousness and thus to perpetuate the confusion in the meaning of the parent word. And for him this is unnecessary. As he uses the terms, the subconscious and the unintrospected or the unintrospectible are identical. A great deal of nonsense would be avoided if persons who mean merely the unintro-

spected would use that term instead of a pseudo-mystic concept like the subconscious; and those who might be trusted, like Spearman, to use the latter term scientifically should none the less renounce it for the sake of these others.

The limitations of space prevent any attempt to summarize or criticize Spearman's analysis of the different kinds of eduction of relations and correlates. We must similarly pass over his criticism of the sensationalist doctrine of thought and his explanation of its origin. Both are matters of detail, though of important detail. Nor may we comment upon the interesting way in which Spearman has analyzed the traditional rubrics of cognition—Perception and Movement, Intellect, Memory, and Imagination—into his six cognitive processes of experiential apprehension, eduction of relations, eduction of correlates, reproduction, disparition, and clearness-variation. The extent of cross-classification makes it doubtful whether both divisions can survive. The advantages of Spearman's treatment cannot be adequately summarized. It will not be denied that his analysis is very neat.

Indeed, the criticism has been ventured that it is too neat, that we have a system of logic, not a system of psychology. The reviewer confesses his inability to understand this much used criticism. At any rate, Spearman's answer is plain: all the processes are alleged to be introspectively discovered under the conditions of experimental control. There is logic in their formulation—there must be—but not in their substance.

Detailed criticism of the five quantitative principles would be premature since the author reserves them for fuller treatment later. The book before us is essentially an exposition of the three noegenetic processes. The treatment of relations is vigorous and their classification has much merit. But it is difficult to see that in principle we have anything novel here. On the other hand, all psychologists who do not rule relations out of their science incontinently must recognize in the eduction of correlates a parallel which is significant. It is a matter urgently demanding investigation whether the differences between "mechanical" and "meaningful" memory—the matter is variously phrased by different discoverers—which crop out every now and then in experimental investigations may not be due to the influences of reproduction and correlate-eduction, respectively. For Spearman shows that the latter *looks* in many cases very much like memorial reproduction and is definitely different. Even those psy-

chologists who give a sensationalistic explanation to the awareness of relations must come to terms with the process of correlate-eduction, though in schema the reduction of this process, deemed by Spearman an ultimate one, will be clear to any sensationalist.

From a systematic viewpoint, however (and avowedly this is the important one), the first cognitive principle is the most significant. It seems innocuous at first but it embodies a complete systematic position. In effect, Spearman is joining Külpe in his return to the Scholastic (and Platonic) position of an "outer and inner sense." Intervening between reality and knowledge we have experience, a mental *state* which we live, enjoy, undergo. This it is which by "inner sense" or *con*sciousness (in the etymological sense) we know or apprehend. "An ordinary percept," to be sure, "especially if visual, will be regarded as including far more than any mere mental state. Instead of furnishing a starting point from which to explain the laws of cognition, it is something very complex, which needs such laws for its own explanation."

The chief support for "this precious distinction" between the knowing of experience and that experience itself is found in experiments described in Chapters XI and XIV. In addition, Spearman cites a veritable cloud of witnesses from Democritus and Plato down to the latest advocate of the Unconscious in whose writing is implicit or explicit this doctrine. The reviewer, though he believes that there is more in cognition than sensation and the mechanics of association, cannot feel that Spearman has made good this point which he obviously regards as central. The experiments cited certainly need confirmation and supplementation. An English critic tells us that he rose from his reading of the book with the feeling that he must review once more the classical authorities and look well to his whole systematic position. The present reviewer is impelled far more to repeat and elaborate Spearman's experiments on clearness.

Nor is it altogether certain, even should the facts prove to be just as Spearman has found them, that they must be interpreted in his way. No doubt since Berkeley it is impossible to conceive of percepts as images of a substantially real world. But in psychology we have to deal with certain objects, forgetful so far as may be of their metaphysical nature. The objects of everyday intercourse have, as known, certain characters. That we first sense these characters (in any psychological and not merely physiological meaning), and then in addition apprehend them, seems an unnecessary and uncalled

for complication. Doubtless there are modes or degrees of apprehension and these we shall have to distinguish; these varieties of apprehension are one of the grounds for positing both sentience and apprehension, the other being the purely philosophical bias that the characters must be somehow mental as such and in their own right.

But it seems much simpler to abandon sentience—and indeed experience as Spearman uses the term—altogether. We should then find ourselves with certain objects—of many sorts—having characters which can be ascertained and listed, and we should have several kinds and degrees of apprehension of those characters. Psychology, while much concerned as to what these characters are which can be apprehended, cares not a straw about their inmost nature. Let them be mental, material, neutral, or mixed. This suggestion seems to the reviewer the most hopeful way of ridding psychology of epistemological difficulties. Apprehension appears to be a more complex process than in Spearman's system, but the complexities arise from the psychological data. And by an ironical twist it looks as if Spearman had provided the upholders of this viewpoint, which may be dubbed psychological realism, with suggestions for the solution of some of their outstanding difficulties.

The style of the book is vigorous and even epigrammatic, overlaid upon a truly scholastic effort at clearness and consistency in the definition and use of terms. The citation of experimental evidence save that from his own laboratory is frequent but generally lacking in detail. Nearly all the data derive from those in the line of the Würzburg school. Mental tests are used more in illustration than in proof, though the author shows how important may be the bearing of these tests upon general psychological theory. (We may confidently expect much more in this direction in the forthcoming book which will discuss the "quantitative" principles of cognition.) But the reader can scarcely avoid the feeling that the important framework of this book is deductive, though it is supported by empirical evidence. But that is clearly the case also with the traditional account, which this book so sharply challenges. We overlook the enormous amount of *a priori* theorizing in our own psychology because we are used to it. Present day psychology cannot ignore this book. Either Spearman is almost entirely wrong or this is one of the most important books in recent years.

HORACE B. ENGLISH

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PORTEUS, S. D. *Studies in Mental Deviations.* Vineland, N. J.: 1922. Pp. xi+276.

There are collected in this volume a number of studies, diverse in content, representing, according to the author, necessary angles of approach to a well-grounded study of mental deviations. The choice of the lines of investigation pursued for these studies has been determined by the fact that the physical, mental, industrial, educational, and social characteristics of the defective have each an important bearing on his social adaptability. Some of the matter published in this book has already appeared in the form of research bulletins dealing with single studies, but is again included in this book so that the various parts of the author's method should not be considered in isolation, but in relation to the general plan followed by him in the study of mental deviations.

For the purpose of some of these studies, without pretending in any way that this constitutes a mental diagnosis, the cases have been divided in two groups—those *below* and those *above* 75 I.Q. (average Binet-Porteus mental ages). Each of these two groups is further subdivided into *well-adjusted* and *mal-adjusted;* and the latter into those showing psychopathic tendencies and those with delinquent tendencies. An interesting conclusion from the analysis which accompanies this classification is that delinquency tends to be associated with the higher grades of defective mentality, and that the really great menaces to society are the dull normal delinquent and psychopathic groups.

In a section devoted to Anthropometric Studies are presented the results of a number of studies of brain capacity as determined by length, breadth, and height of head. In summing up the results, the conclusion is drawn that for the *well-adjusted* groups there is a decided relation between the size of the head and intelligence; the lower the mentality, the lower the average capacity and the greater the percentage of extreme deviation either in capacity or single measurement. The *delinquent* groups do not show the same relation between brain capacity and mental level, their average capacities and distribution of percentiles approaching much nearer to the normal. On the other hand, as regards the form of the head as expressed by cranial indices, the *psychopathic* show a greater percentage of marked deviations from the normal averages. With reference to these and other results the author observes that the comparison of averages, unless based on a large number of cases, may be misleading. He fails

to emphasize, however, the inadequacy of the average as a criterion for individual diagnosis.

A chapter is devoted to the discussion of the history of the Porteus Maze Test and to a report of recent investigations with this test. These investigations lead to the conclusion that "as regards the prognosis of educational progress the Binet test has considerably better reliability than the Porteus, but that as regards social and industrial adaptability the advantage is with the Porteus test, particularly in the case of girls." As a diagnostic symptom it is said that a distinctly lower Porteus than Binet age may be considered indicative of social and industrial inadaptability, maladjustment being very frequently due to psychopathic tendencies. The advantage of combining the two tests into a battery and the greater reliability of the combined results in prognosing social and industrial adaptability is discussed.

A lengthy chapter is devoted to discussions of a social rating scale devised by Porteus and to a discussion of experimental investigations of its usefulness. The social rating scale under discussion is one limited to the subsocial, that is, one for rating social inefficiency rather than the degrees of social efficiency. The traits to be judged are confined to defects and the number to be rated are those which are most characteristic of defectives. There are many sound conclusions about social rating scales in general, but the reviewer questions the validity of the procedure of comparing ratings on the scale with social estimates by the same observers as a method of checking the reliability of the Porteus scale. The r .94 which such a procedure gives in one case may very well be more an indication of the agreement of the individual observer with himself than a sign of the usefulness of the scale under discussion. A few pages are devoted to a discussion of the correlation of mental tests with social ratings.

In a chapter on Analysis of Binet Results is presented a battery of eight tests selected from the Binet series to be used in obtaining a Binet diagnostic score, which has a positive value in that it is very improbable that a child making that score will be feebleminded. It is also pointed out that results obtained by the author cannot confirm the view that "scattering" on the Binet is a very reliable indication of psychopathy.

A very interesting chapter in the book describes an industrial rating scale devised by the author. A job analysis was made of every occupation in the Vineland institution and a scale constructed

which makes possible a comparison of the industrial capacity of not only children engaged in the same occupation, but those working in different occupations. A group of children were rated and it was found "that ratings of children on this scale accorded extremely well with general estimates of industrial capacity as given by judges with most experience." Results further demonstrated that the composite mental age is the best indication of industrial efficiency, and they gave further proof of the close relation of the Porteus maze test age to industrial aptitude.

This volume by Porteus well deserves the attention of those interested in clinical psychology and in problems of mental testing. The wide experience of the author makes it possible for him to contribute much in the general discussion of the problems in both fields. His criticism of the Stanford I.Q. as a definition of feeblemindedness and of the plan for making the Binet the touchstone of reliability and validity for all other tests are examples in point. In the interpretation and discussion of specific conclusions to be drawn from scientific investigations the author does not, however, appear at best advantage. There is a tendency to value too highly difference of .05 or 1.0 in r. There is a tendency to draw broad conclusions on differences in averages which do not appear significant to the reviewer. There are also weaknesses in method which might have been stressed more emphatically.

From the point of view of organization there is much to be sought for in the way of improvement. The content of the individual studies are related in so far as they come within the general field of studies of mental deviations, but there is no attempt to weave the subject matter of the individual studies into a unified point of view. The statement such as "it is ridiculous to think that the mere statement of mental age gives us any very useful information about the special industrial aptitudes and interest of a defective" in one study vies with the highly laudatory statement about the Porteus maze and the composite mental age in predicting industrial adaptability in other studies. However, this defect is probably counterbalanced by the greater accessibility of the studies in the new form and by the repeated statement of Porteus they represent only a beginning, and not the final word, in the investigations of mental deviations.

Morris S. Viteles

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BENNETT, HENRY EASTMAN. *Psychology and Self-Development.* Boston: Ginn. Pp. viii+296.

This book purports to contain: "(1) That which will function directly in increasing the student's capacity as a learner; (2) that which will afford the most useful basis for a course in teacher training; (3) that which will best meet the needs for a first course in college psychology." In addition the author wishes to interest the student in a further pursuit of the subject and help him reconcile his scientific knowledge and religious belief.

The style and language are very popular and easily read. In conformity with his statement of the purpose of the book, the author begins with a chapter on "The Art of Learning"; however, he tells us nothing of importance concerning this art, except how to take notes on lectures and readings. He omits most of the things usually contained in a discussion of the learning process. The second chapter tells us that the basis of learning is the strengthening of synapses by means of pleasurable responses. The thrill of pleasure is "Nature's O.K. on the particular combination of synapses involved. . . . It seems to both put force into the current, thus making stronger the synaptic bridges of this particular pathway, and to afford pleasure, which is nature's way of getting the act repeated." We may overlook the mixed metaphor, but to talk of "Nature's O.K." seems out of place in a scientific textbook.

In the chapters on instinct and habit, the instincts are compared to the unharnessed forces of nature, such as winds, streams, and the energy buried in coal, petroleum, and gasoline; habits are like the machines through which these energies are utilized. The validity of this comparison seems very questionable. The classification of instincts and discussion of habit as a whole is rather superficial. There are the usual chapters on sensation, perception, concepts, etc., written from the introspective point of view and in very popular language. The concluding chapters on "The Whole Mind," "The Disorganized Mind," and "The Powers of a Trained Mind," are philosophical rather than psychological. The nearest the author comes to a definition of psychology is the statement: "All mental life is but some form of unifying, integrating or joining together, and psychology studies the kinds and qualities thereof." This definition is characteristic of the nature of the whole book.

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PRESCOTT, FREDERICK CLARKE. *The Poetic Mind.* N. Y.: Macmillan, 1922. Pp. xx+308.

Mr. Prescott finds that the operation of the poet's mind lies halfway between the provinces of literature and psychology, and he attempts to treat of it from the point of view of literature. Of the sixteen chapters of the book, the first two are largely occupied with definition and example. Mr. Prescott then devotes a chapter to man's two modes of thought, and goes on to an extended treatment of the poetic imagination on the basis so laid down. Two more chapters are devoted to the unconscious mind and to the desires and emotions in poetry. After a consideration of these formative elements, in the latter part of the book he studies the working out in poetry of the poetic imagination, treating, for example, of the use of symbols and figures, and of the utility of poetry.

The main points in Mr. Prescott's book may perhaps be summarized in an attempt to find from his work answers to the following questions: What is poetry? What does the poet do in making it, and how is the poet's mind different from that of the ordinary man? Mr. Prescott gives his working definition of poetry thus: "These are the two tests then—the presence of imagination in the substance and of rhythm in the form; whatever satisfies these tests will be included as poetry in the following discussion" (p. 9). The thought of the poet is different from that of the ordinary man of action, and is closely allied to that of the dreamer. He, too, seeks the deeper sources of moral wisdom which our conscious waking mind cannot ascertain, and by this visionary thought he produces poetry. Mr. Prescott's exposition then deals with the two kinds of thought which he finds in man: associative thought and voluntary or purposive thought. The poetic vision, like the ordinary dream, is concrete, while at the same time it derives its material only indirectly from the senses; this vision is the source of true poetry.

Mr. Prescott admits that no hard and fast line may be drawn between this free, visionary thought and the purposive thought of daily life, but he bases the greater part of his explanation of the poetic imagination on the former. It is the primitive manner of thought, to which man reverts when his mentality is insufficient to cope with a situation. The mental insufficiency of the poet is due to the magnitude of his subject, not to a naturally weak mind; so, "voluntary thought being useless, the only resort is purposeless or merely associative thought" (p. 74). Mr. Prescott finds that this

mental operation is often partly unconscious. "The unconscious is the deeper and more vital mind, of which the intellect is a specialization—a tool or instrument employed for practical purposes" (p. 90) and the poet has the power of utilizing this unconscious material. On analysis, his thought is found to consist of concrete images, which correspond to reality and also to the poet's wishes, desires, or aspirations, which in turn are "the motive force and stand at the beginning of the poetic process" (p. 129). Emotion always accompanies them. Mr. Prescott finds, then, that the operation of ordinary thought and that of the poetic mind may be differentiated as follows: "In each case the desires are the originating or motive element; in the first they suggest a conscious end, which will presumably lead directly or indirectly to their satisfaction, and this end, established by the will, governs the imaginative presentations; in the second the desires work their own will, and find direct satisfaction in the pictures presented by the imagination, which are lawless except in so far as they are bound thus to furnish satisfaction to the desires which prompt them. This is the faculty of imagination" (p. 144). From this point on Mr. Prescott gives a rather technical development of his theme; he treats of the external and internal elements of the imagination, of its recent and early sources, of condensation and displacement. The method of poetical composition is considered, and finally the utility of poetry.

It is notable that Mr. Prescott proceeds in his volume by a method of analysis and example. He emphasizes the parallel of dream and poetry by quotations from authorities, for instance. From the angle of literature his use of this method is pronounced, and the poets themselves furnish his evidence. "The poets are in general excellent psychologists, and where the question concerns the working of their own minds they are the best. Psychology must obtain most of its facts ultimately from introspection. If then . . . the poet's mind is to be investigated, the poets are obviously in sole possession of the most important data" (p. x).

Given, then, Mr. Prescott's method and his thesis, can it be said that in this book, which is clearly and interestingly written, he has adequately treated of the operation of the poet's mind? It must be noted here that Mr. Prescott places among his basic assumptions various Freudian principles—wish-fulfilment in dreams and poetry, for example—which would not meet with universal acceptance. His conception of the unconscious and his interpretation of the mechan-

ism of the processes of imagination (condensation, displacement, the use of symbols, etc.) are also open to controversy. But perhaps a more fundamental difficulty to conviction of his thesis lies in his primary analysis of the two modes of thought. Mr. Prescott quotes authority for his distinction between purposive and visionary thought, but finds that there is probably a difference in degree only between the two. On the other hand, his whole exposition of the poetic mind seems to depend upon the existence of a distinct, visionary thought-process, different in kind from ordinary thinking. This assumption presents difficulties to the reader. Mr. Prescott's acceptance of the evidence of the poets themselves in regard to psychological truths also makes his conclusions seem of doubtful validity. Not everyone will be willing to agree with him that the poets are in general excellent psychologists, nor will everyone grant that "psychology must obtain most of its facts ultimately from introspection." As Mr. Prescott bases many of his arguments on this more or less uncertain evidence, it is doubtful whether the reader will be convinced of the conclusions he draws in connection with the psychological study of the poet's mind. From the point of view of literature, Mr. Prescott's book may be of greater interest.

L. Dillingham

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Baudouin, C. *Studies in Psychoanalysis.* N. Y.: Dodd, Mead, 1922. Pp. xxiv+508.

The attitude of the French mind towards psychoanalysis has been characterized, in general, by indifference or skepticism. This has been due, among other things, to the lack of rapport between the new and the older psychologies, and to the turbidity and to the presumption of some of the psychoanalytic teachings. Baudouin's aim is "an unceasing collaboration between autosuggestion and psychoanalysis" (p. 16), and he presents in this book the results of his work. In addition, he attempts an exposition of psychoanalysis for the French reader, and searches "for points of contact between psychoanalysis and ordinary psychology" (p. 4). Despite the claims of the translators, the beginner will be handicapped by a lack of previous orientation, even in the case histories, which occupy two-thirds of the book. These histories, while incomplete, are engagingly written. By their perusal, according to the translators, the beginner "will be able to enjoy a course of Psychoanalysis without Tears" (p. xv). For the

orthodox analyst, they will probably be without depth as well; but Baudouin should not fail in his desire to "interest experts."

The theoretical part of the book is very worthwhile, and contains much stimulating discussion that is presented with admirable clarity. Baudouin, oddly enough, deals more successfully with his consideration of psychoanalysis, as he understands it, than with his main thesis: the conjoined use of psychoanalysis and suggestion. In the latter case he generalizes extensively, and there is a notable lack of concrete explanation. (An example of the few exceptions to this is the statement [p. 410]: "While practising [psychoanalysis], I faced the subject; for the practice of [suggestion] I stood behind her.") Indeed, we are informed that a knowledge of the "law of subconscious teleology" (*i.e.*, when the end has been suggested, the subconscious finds means for its realization) "has led Coué to substitute to an increasing extent *positive* and *general* suggestions for *negative* and *particular* suggestions" (p. 134). Thus, Baudouin believes, the objection of the psychoanalysts that suggestion merely leads to further repression, is obviated.

Suggestion probably enters into all psychoanalytic practice to some extent. Many psychoanalysts recognize this frankly and attempt to minimize the extent; others minimize even the probability. Baudouin's desire to "guide" suggestion intelligently is a worthy one; perhaps he does so in practice, but he leaves many pertinent questions unanswered here. The translation is excellent.

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YERKES, ROBERT M., and LEARNED, BLANCHE W., *Chimpanzee Intelligence and Its Vocal Expressions. Pt. I, Traits of Young Chimpanzees; Pt. II, Voice and "Language" of Young Chimpanzees.* Baltimore: Williams & Wilkins, 1925. Pp. 157.

NOTES AND NEWS

The Eighth International Congress of Psychology will be held at Groningen, Holland, from September 6 to 11, 1926, under the presidency of G. Heymans. Psychologists who, having received no invitation, wish to attend the Congress, are requested to apply to the First Secretary, Professor Dr. F. Roels, 86 Maliebaan, Utrecht, Holland.

Dr. Harry Dexter Kitson, of the University of Indiana, has been appointed professor of education in Teachers College, Columbia University.

Professor Henry H. Goddard, of Ohio State University, sailed for Honolulu on May 13, to deliver a series of lectures under the auspices of the University of Hawaii.

Dr. English Bagby, assistant professor of psychology at Yale University, has been appointed associate professor of psychology at the University of North Carolina. Here he will be in charge of research problems in student personnel in addition to his teaching.

Professor Coleman R. Griffith, of the University of Illinois, has been awarded a fellowship by the John Simon Guggenheim Memorial Foundation for research in child psychology, principally at the University of Giessen.

Professor Edward L. Thorndike, of Teachers College, Columbia University, has been awarded the Butler gold medal, given every five years by Columbia University for the most distinguished contribution to philosophy or to educational theory, practice or administration, for his contribution to the general problem of the measurement of human faculty and to the application of such measures to education.

At the University of Pennsylvania, Dr. M. S. Viteles has been promoted to assistant professor of psychology.

In an article published in the *Psychological Review* for May, 1924, entitled "Measurement of Intelligence," there was a reference to future articles of the series. It was intended at the time to publish such articles, but the material was highly technical and much more extended than had been anticipated. It therefore seemed better to discontinue the series. The material is being published as a monograph entitled "Measurement of Intelligence."

Vol. 22, No. 9 September, 1925

THE PSYCHOLOGICAL BULLETIN

1. GENERAL

672. Reiser, O. L., Behaviorism as a Monism of Action. *Amer. J. of Psychol.*, 1924, **35**, 545–558.

To understand the unity of behavior as a monism of action it is necessary to interpret behavior in the light of its evolution from the irritability of living tissue, an irritability which is the property of unstable chemical compounds. The simplest nervous systems are of the " nerve net " type, upon which (remaining as the autonomic system) the synaptic cerebrospinal nervous systems of the vertebrates are superimposed. The evolution of receptors is a process of specialization of primitive irritability which accompanies differentiation of the central integrating mechanism. Binding together the development of receptor and of central mechanism is a functional correlation, which is probably hormonic in nature. Cerebral behavior, or intelligence, is likewise a result of evolution. The phenomena of the conditioned reflex point to the essential unity of inherited and acquired action. Psychic synthesis is a process of physiological integration in which unity of action results from a relation of dominance and subordination between integrating mechanisms on different synthetic levels of a hierarchy. G. J. Rich (Chicago, Ill.).

673. Gilman, B. I., Psycho-Anaesthesia. *Amer. J. of Psychol.*, 1924, **35**, 583–592.

" By psycho-anaesthesia is here meant the philosophic tendency to ignore other people while admitting the distinction from oneself. Since this distinction concerns different minds, the term approxi-

mately follows the pattern of the compounds 'color-blindness' and 'tone-deafness.' Like the words 'color' and 'tone' the prefix 'psycho' names both the things reduced to one—in the present instance inconsistently." A tide of psycho-anaesthesia is astir in the pragmatic and realistic philosophies of the past and present generations. Examples are to be found in B. Russell's *Analysis of Mind* and in Behaviorism. The chief source of this tide is the imposing modern growth of experimental science. The psycho-anaesthesia of the present scientific age is like the visual anaesthesia engendered by a brilliant light that for a time obscures other things which are nevertheless there. G. J. Rich (Chicago, Ill.).

674. Kelley, T. L., How Many Figures Are Significant? *Science*, 1924, **60**, 524. G. J. Rich (Chicago, Ill.).

675. Satterly, J., How Many Figures Are Significant? *Science*, 1925, **61**, 90. G. J. Rich (Chicago, Ill.).

676. Linzbach, Psychiatrie und Philosophie. *Arch. f. Psychiat. u. Nervenkrankheit.*, 1924, **71**, 631–642.

Verf. will "das höchste der Ziele der Psychiatrie" zeigen, nämlich "ihre Beziehung zum Absoluten." In der psychiatrischen Praxis soll die Philosophie "zwischen Medizin und Theologie stehen" usf. Th. Ziehen (Halle a/S.).

677. Norris, O. O., The X and Y of Psychology—II. *J. of Philos.*, 1923, **21**, 561–82.

We have not meant to say that we think with our synapses in the first article, nor with the cortex, brain or nervous system. The age-old problem of the nature and locus of consciousness is involved here. While we may control behavior without understanding consciousness still we ought not to "shy away" from this baffling problem of the nature of consciousness. The qualia of consciousness have definite loci as characters of impacts. The question is how to explain differences of conscious experience by means of impacts and their qualia. This question breaks up into two parts, viz., to account for all the differences in qualia of conscious and to indicate where they occur. We believe that each synapse which serves as a locus of consciousness has its own specific quale. All the synaptic loci are included in two planes, the afferent and the efferent. In short the X of psychology is the differential qualia of impacts; the Y of psy-

chology is the logarithmic relation between quanta and vividness of qualia of synaptic impacts. T. R. Garth (Denver).

2. NERVOUS SYSTEM

678. Pines, J.-L. J., Ueber die Innervation des chromaffinen Gewebes des Sympathicus und das sympathico-chromaffine System im Allgemeinen. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, **70**, 636–647.

Bei der wichtigen Rolle, welche das sogen. chromaffine Gewebe nicht nur in unserem vegetativen Leben, sondern auch im Bereich der Affekte und Instinkte spielt, und bei der vielerörterten Streitfrage, ob die früher angenommene nervöse Korrelation der Organe durch die humoral-endokrine vollständig ersetzt werden muss, bietet es ein sehr grosses Interesse festzustellen, wie weit die sekretorische Tätigkeit der chromaffinen Zellen (Paraganglien, parasympathische Organe) vom Nervensystem abhängt. Aus den Untersuchungen des Verfassers ergibt sich, dass die in den sympathischen Ganglien gelegenen chromaffinen Zellgruppen reich innerviert werden, und zwar sowohl von marklosen wie von markhaltigen sympathischen Nervenfasern, die teils ein interzelluläres Endnetz teils perizelluläre korbartige Geflechte teils Knöpfchenendverdickungen an der Zelloberfläche bilden. Es ergibt sich hieraus biologisch ein bemerkenswertes Doppelverhältnis: die Sekrete des chromaffinen Gewebes wirken reizend auf den Sympathicus, und Reizung des Sympathicus wirkt anregend auf die Sekretion des chromaffinen Gewebes. Th. Ziehen (Halle a/S.).

679. Berze, J., Zur Frage der Lokalisation psychischer Vorgänge. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, **71**, 546–580.

Verf. wendet sich gegen die Ausführungen Bergers (*Arch. f. Psychiat.*, 1923, **69**), wonach den Ausfällen ganz bestimmter psychophysiologischer Leistungen auch Ausfälle ganz bestimmter, anatomisch besonders gebauter Rindenfelder entsprechen sollen. Nach seiner Auffassung existiert in der psychophysischen (intentionalen) Sphaere *überhaupt keine "Lokalisation"* im gebräuchlichen Sinne, weder eine grob noch eine fein anatomische. Er behauptet, dass es keinen lokalen Defekt der Rinde gebe, durch den irgendein "reinpsychischer" Vorgang, und sei er der allereinfachste, völlig unmöglich gemacht werden könnte. Was ein solcher Defekt

mit sich bringen kann, soll immer nur die Verlegung eins oder des anderen "Weges der Auslösung" (Ekphorie) des betreffenden psychischen Vorganges, vielleich des gangbarsten dieser Wege, sein; "seine Produktion resp. Reproduktion gänzlich unmöglich machen kann er nicht." TH. ZIEHEN (Halle a/S.).

680. LANDOU, E., Zur Frage der Hirnfurchung. *J. f. Psychol. u. Neurol.*, **30**, (4/5), 201.

Die Hirnfurchung steht in keinem ursächlichen Zusammenhang mit dem Status verrucosus Retzii, jenen Wärzchen, die nur vorübergehende embryonale Gebilde darstellen. Selbst wenn man sie nicht als kadaveröse Mazerationsprodukte oder als pathologische Gebilde auffasst, lässt sich nicht der Beweis erbringen, dass sie die Gyrifizierung einleiten. Dagegen spricht vielmehr schon die Tatsache, dass sie überall an der Gehirnoberfläche ganz gleichmässig verteilt sind; ferner die normale Existenz und lebenslängliche Persistenz eines Status verrucosus auf dem Caput des Gyrus hippocampi des Menschenhirnes. Die Histogenese der Hirnfurchung lehrt, dass streifenförmige Proliferationszentren, welche das allgemeine Niveau im Sinne einer entstehenden Windung emporheben würden, nicht vorkommen. Das primäre Moment in der Gyrifizierung ist vielmehr die Furche. Sie dokumentiert sich in ihrer ersten Anlage als eine Delle, eine Vertiefung, in deren Grund sich die Elemente der Lamina corticalis von dem sie bedeckenden Randschleier zurückziehen, um auf diese Weise unterhalb desselben eine Zona lucida zu bilden. Links, rechts und unterhalb der Furche sieht man halbkreisförmige Biegungen der plasmatischen Stützradien. Während L. diese mikroskopischen Bilder als Stütze seiner Auffassung des Gyrifizierungsvorganges als primärer Furchenbildung betrachtet, fühlt er sich nicht in der Lage, den ganzen mechanischen Werdegang der primären Furchenbildung aus den Schnitten in der Vorstellung zu rekonstruieren. W. RIESE (Frankfurt a/M.).

681. AYALA GIUSEPPE, Weitere Untersuchungen über den Nucleus subputaminalis. *J. f. Psychol. u. Neurol.*, **30**, (5/6), 285.

Der Nucleus subputaminalis besteht beim Menschen aus einer Gruppe voluminöser Nervenzellen, die sich unter dem ventralen Rande des Putamen und zum guten Teil seitlich der Commissura anterior befinden. Beim Schimpansen wird eine Nervenzellgruppe angetroffen, die in Morphologie und den übrigen Verhaltnissen voll-

kommen dem Nucleus subputaminalis des Menschen entspricht. W. Riese (Frankfurt a/M.).

3. SENSATION AND PERCEPTION

682. Swindle, P. F., Effect of Strychnin on Visual Reliability. *Amer. J. Physiol. Optics,* 1925, **6**, 3–22.

Strychnin in small and in large enough doses to tone up the skeletal muscles improves both visual and tactual reliability. S. W. Fernberger (Pennsylvania).

683. Laurance, L., and Wood, O., The Far Points of Accommodation and Convergence. *Amer. J. Physiol. Optics,* 1925, **6**, 23–31.

The normal far-point of accommodation varies with the size of the pupil and in meters is equal to 7.5 times the diameter of the pupil in mm. The normal far-point of convergence varies with the interpupillary distance and in meters is equal to 7.5 times the distance between the pupils in mm. S. W. Fernberger (Pennsylvania).

684. Byrd, H., The Phenomena of Diplopia Explained Through the Laws of Physiological Optics Instead of the False Orientation Theory. *Amer. J. Physiol. Optics,* 1925, **6**, 49–55. S. W. Fernberger (Pennsylvania).

685. Neifeld, M. R., Dr. Troland's Discussion of the Color Sensations. *Amer. J. Physiol. Optics,* 1925, **6**, 70–79.

Criticism of Troland's cortical explanation of color sensations. The author also points out that Troland's criticisms of the Ladd-Franklin theory are not adequate. S. W. Fernberger (Pennsylvania).

686. Shuey, A. M., The Flight of Colors. *Amer. J. of Psychol.,* 1924, **35**, 559–582.

Colored after-images were obtained by fixation, in a dark room, of a colorless illuminated cross. The intensity of the stimulus and the time of exposure (ranging from 5 to 90 sec.) were varied in separate series. The hues of the after-images following the weakest and shortest stimulations were B and R, and occasionally G, while those following stronger and longer stimulations were Y, R, B and

G, in spectral order, with infrequent additions of P, O and Bk. The temporal course of the image varied with the intensity and duration of stimulation. On the extensive side, the images gradually shrank prior to disappearance. Movement and position played an important part in the flight of colors. G. J. Rich (Chicago, Ill.).

687. Crosland, H. R., A Case of Achromasia with Complications. *Amer. J. of Psychol.*, 1924, **35**, 593–601.

A case of total color-blindness is reported, in which the subject uses foveal vision. His brightness vision is that of daylight, in which yellow stands out as the brightest portion of the spectrum. Of the two eyes, the right is the weaker, with 1/15 of normal vision, and the left the stronger, with 1/10 of normal vision. Both eyes are highly astigmatic, but the right eye appears to be so in quadrants the opposite of those that mark the astigmatism of the left eye. In visual discrimination and the drawing of a line 5 cm. long, this subject is markedly inferior to normal persons. But in drawing a similar line from memory the inferiority is less noticeable. His range of visual perceptual attention is one-half of normal, despite poor vision. It would appear that in this test, as in the drawing from memory, his memory frequently supplements and corrects for him in his acts of perceiving. G. J. Rich (Chicago, Ill.).

688. Granit, R., Die Bedeutung von Figur und Grund für bei unveränderter Schwarz-Induktion bestimmte Helligkeitsschwellen. *Skand. Arch. f. Physiol.*, 1924, **45**, 43–57.

Von verschiedenen Autoren ist die Tatsache gefunden worden, dass die auf weissen oder bunten Flächen bestimmten Schwellen weisser oder bunter Lichter mit zunehmender Ausdehnung der Flächen niedriger werden. Meist ist diese Tatsache aus dem Kontraste abgeleitet worden, besonders aus dem sogenannten "Binnenkontraste." Granit zeigt indessen durch neue geistreich ersonnene Versuche, dass es sich hierbei um eine besondere Wirkung der "figuralen Ausgeprägtheit" handelt. Einem "Figurenfeld" entspricht ein lebhafteres psychophysisches Geschehen als einem gleichhellen "Grundfeld." Der Zusatzreiz bei der Schwellenbestimmung hat also ein um so matteres psychophysisches Geschehen zu überwinden, je mehr der Character des Figurenfeldes an Ausgeprägtheit verliert: Gerade dies aber tritt mit der Vergrösserung des Mittelfeldes ein, und erklärt so auch die Verkleinerung der Schwelle. O. Klemm (Leipzig).

689. Meissner, O., Der Ostwald'sche Farbdoppelkegel. *Zeit. f. Physik.*, 1924, **21**, 68–72.

Mathematische Darstellung des Farbkegels, der durch Rotation des Farbdreiecks um seine Grundachse entsteht. O. Klemm (Leipzig).

690. Krüger, K., and Zenneck, J., Über das Dämmerungssehen mit Ferngläsern. *Ann. d. Physik.*, 1924, **73**, 242–248.

Bei Dunkelheit erscheinen im Fernrohr auch flächenförmige Objekte deutlicher, obgleich doch die Flächenhelligkeit der Bilder auf der Netzhaut nicht vergrössert wird. Die Grundlagen hierfür werden nachgewiesen: Physiologische ist von physikalischer Flächenhelligkeit zu unterscheiden, auch die Unschärfe der Abbildung durch die Pupille, die bei Dunkladaptation vergrössert ist, wird durch das Fernrohr kompensiert. O. Klemm (Leipzig).

691. Malmiwirta, F., and Mikkonen, H., Zur Kenntnis der Glukosurie bei der Abiturientenprüfung. *Skand. Arch. f. Physiol.*, 1924, **45**, 68–73.

Von früheren Autoren ist gelegentlich beobachtet worden, dass im Anschluss an schwere Examensprüfungen eine vorübergehende Glukosurie auftritt. Bei einer Nachprüfung an den Teilnehmern einer schriftlichen Maturitätsprüfung wurden die Harnproben unmittelbar vor dem Anfang und nach dem Ende der betreffenden Prüfung genommen. Es liess sich in der Tat fast in allen Fällen eine Zunahme des Zuckergehaltes nachweisen, die sogar in interessanter Weise dem Schwierigkeitsgrade der einzelnen Fächer und der Dauer der ganzen Prüfung zugeordnet war. O. Klemm (Leipzig).

692. Birnbacher, Th., and Klaften, E., Die Hemeralopie der Schwangeren. *Zeits. f. Augenheilkunde*, 1923, **51**, 309–324.

Die Gravidität stellt einen wesentlichen Faktor für das Auftreten der Hemeralopie (Nachtblindheit) bei den Schwangeren dar. Der erschwerte Säfteaustausch der Gewebe und die gestörte Ausscheidung toxischer Produkte durch Leber und Niere hindern die Wegschaffung verbrauchter Sehsubstanzen im Pigment- und Sinnesepithel der Retina, und machen diese gegen die Einwirkung der Blendung empfindlicher. O. Klemm (Leipzig).

693. Mennerich, P., Ein Fall von Retraktionsbewegungen der Augen bei angeborenen Anomalien der äusseren Augenmuskeln. *Zeits. f. Augenheilkunde,* 1923, **50**, 173–180.

Schildert einen seltenen klinischen Fall von angeborenen Bewegungsstörungen der äusseren Augenmuskeln, der für die Entwickelungsgeschichte der Augenbewegungen bedeutungsvoll ist. O. Klemm (Leipzig).

694. Witte, O., Zur Myopiefrage. *Zeits. f. Augenheilkunde,* 1923, **51**, 163–180.

Myopie fand sich unter 34,753 Patienten in 16 per centum bei den Männern, in 11 per centum bei den Frauen. Dagegen kamen die höheren Myopien, etwa von 10 D an, viel häufiger bei den Frauen vor. O. Klemm (Leipzig).

695. Bardorf, W., Untersuchungen über räumliche Angleichungserscheinungen. *Zeits. f. Psychol.,* 1924, **95**, 181.

Wird eine Reihe gleichartiger und in gleichen Abständen angeordneter Figuren (z.B. Kreisflächen), von denen einer um einen kleinen Grössenbetrag von den übrigen abweicht, bei fixiertem Blick und einheitlicher Zusammenfassung beobachtet, so wird bei vielen Versuchspersonen die Grössendifferenz bei deutlichem scheinbaren Wachsen oder Schrumpfen ausgeglichen. Reine Grössendifferenzen sind leichter auszugleichen als Formverschiedenheiten (z.B. Kreis-Ellipse, Rechteck-Quadrat). Es kann aber auch der Fall eintreten, dass die Differenz sich zu vergrössern scheint. Bei Versuchspersonen, die gewohnt sind, sehr genau zu beobachten, zeigen sich die Angleichungen schwerer. Bei Kreisflächen, parallelen senkrechten Strichen, horizontalen Strichen, die auf einer Geraden liegen, und bei Fadenabständen wurde die Angleichungsmöglichkeit quantitativ untersucht. F. Schumann (Frankfurt a/M.).

696. Hecht, H., Experimentelle Untersuchungen über die Wahrnehmung von Figuren, die hinter einem ruhenden Spalt vorüberziehen. *Zeits. f. Psychol.,* 1924, **94**, 153.

Die vorliegende Untersuchung will einen Beitrag liefern zur Aufklärung der von Zöllner zuerst gefundenen sog. anorthoskopischen Täuschungen. Sie beschäftigt sich vor allem mit den Zerrbildern, die simultan im Bewusstsein auftreten, obwohl die entsprechenden Figuren successiv im Spalt erscheinen. Versuche mit verschiedenen Spaltformen ergaben, dass die Seitenkonturen

der gesehenen Figur sich innerhalb gewisser Grenzen umsomehr der Form des jeweils verwendeten Spalts anglichen, je grösser die Geschwindigkeit der objektiven Bewegung war. Mit Hilfe von stroboskopischen und anderen Versuchen wurde ferner festgestellt, dass die seitlichen Konturen im Sehraum langsamer wandern als die wirklichen Konturen im objektiven Raum. Mit diesem langsamen Wandern dürfte die scheinbare Verschmälerung der Gestalt im Zusammenhang stehen. Im Anhang der Arbeit wird eine neue Anordnung zur Kontrolle der Augenbewegungen angegeben. Ausserdem wird noch eine dem Zöllnerschen Phänomen verwandte Erscheinung besprochen, bei der neben der Verzerrung der Figur auch eine Aenderung in der Bewegungsrichtung auftritt. F. SCHUMANN (Frankfurt a/M.).

697. WITTMAACK, K., Über die intravitale Entstehung von Kollaps- und Degenerationsvorgängen an den Sinnesendstellen des inneren Ohres. *Arch. f. Ohren-, Nasen- u. Kehlkopfheilk.*, 1924, **112**, 43–52.

Beobachtungen am Gehörorgan des Tieres und des Menschen lehren beträchtliche Kollaps- und Degenerationsvorgänge an den Kutikulargebilden, an der Reissnerschen Membran und endlich an dem ganzen Cortischen Organ kennen, von denen anzunehmen ist, dass sie nicht postmortal, sondern noch intravital entstanden sind. Da sich nun trotz einer solchen intravitalen Genese nur geringfügige funktionelle Veränderungen zeigen, müssen wir die Vorstellung fallen lassen, als sei zum Hörakt ein völlig unverändertes Cortisches Organ erforderlich. Hierauf gründen sich wichtige theoretische Folgerungen, die uns die Analogie der akustischen Sinnesendzellen zu den Sinnesorganen der Haut in einem neuen Lichte zeigen. O. KLEMM (Leipzig).

698. SCHULTE, R. W., Ueber die Wohlgefälligkeit von Farben- und Dreifachfarbverbindungen. *Zeits. f. angew. Psychol.*, 1924, **24**, 42–50.

In einer ausgedehnten Experimentaluntersuchung mit Versuchspersonen verschiedenster Herkunft wird eine Wohlgefälligkeitsskala der in der Reklametechnik am häufigsten verwendeten Farben erarbeitet. Die Reihenfolge der Wohlgefälligkeit sei hier angegeben. Die wohlgefälligste Farbe steht am Anfang: Violett, Ultramarinblau, Tiefrot, Grau, Zyanblau, Mittelrot, Schwarz, Hellrot, Ocker-

mittel, Blaugrün, Zitronengelb, Purpur, Ockerhell, Weiss, Hellgrün, sehr helles Grün, Blaugrün hell, Orange. Unterhalb der "mittleren" Wohlgefälligkeit liegen die Farben von "Schwarz" an. Ferner wird die Wohlgefälligkeit von 252 Dreifachfarbenverbindungen auf einer Tabelle eingehend dargestellt. H. Bogen (Berlin).

4. FEELING AND EMOTION

699. Marston, W. M., A Theory of Emotions and Affection Based Upon Systolic Blood Pressure Studies. *Amer. J. of Psychol.*, 1924, **35**, 469–506.

Fear is primarily the awareness of a motor conflict within the organism, at a nervous level correlated with consciousness, between motor impulses flowing from an appetitive will-setting and motor impulses from anti-appetitive perceptions, that is, from perceptions that tend towards self-depletion. Thus, a person is not afraid because he is running away, but because he is not running away fast enough. Anger, similarly, is a condition of conflict within the organism. In this case the conflict is between self-enlarging appetitive will-settings and self-depleting will-settings, of which sex is typical. The self-enlarging type of behavior called appetitive is the result of a definite psychophysiological mechanism. It starts from intraorganic stimulation, of the type of hunger contractions. If the appetitive response is successful, it progresses from a sharp U, through a mixed P and U, to the disappearance of the initial U and the presence of a rather extended P. If unsuccessful, it passes to an extreme U. Sex responses, on the other hand, are self-depleting patterns of behavior. In them, also, the basic mechanism of stimulation is intraorganic. But the response starts as a P stimulus which gives rise to will-impulses leading to the depletion of the organism, and progresses, if successful, to continuance of the P. U is the conscious correlate of motor antagonism between impulses or groups of impulses seeking outlet over a common final efferent path, and is probably also correlated with unrelieved thalamic summation of sensory impulses in the circuits of the unsuccessful competing impulses. The passing of any subminimal sensory impulse to unimpeded motor discharge, over any thalamic nerve path correlated with consciousness, is accompanied by P. G. J. Rich (Chicago, Ill.).

700. Nafe, J. P., An Experimental Study of the Affective Qualities. *Amer. J. of Psychol.*, 1924, **35**, 507–544.

A direct experimental attack was made upon the affective qualities by presenting stimuli which might be expected to set up affective experiences of moderate intensity and by so instructing the observers that they should be observers of feeling rather than feelers. Under the conditions of the experiment, affection is palpable; it stands up under observation. When sensory experience becomes P or U, it alters as a whole; something is added to it that is not present while it remains indifferent. Qualitatively, this increment is bright pressure or a touch-quality lying between bright pressure and tickle, in the case of a P experience; and a dull pressure or a quality lying near dull pressure, in the case of an U experience. The bright pressure is more extended than the dull pressure of the same intensity, but both P and U may vary in extensity. The affection is sometimes beaten up with the rest of the experience, and sometimes partially separated from it. P and U are both inherently weak and mild; but they may vary in intensity. There are also patterns of density for the two affective experiences. At a high degree of intensity, affective experience becomes perceptive. In the case of U, it was reported to pass over into emotion at this stage. The affective component of an experience rises after the sensory component; P comes in gradually though quickly, while U comes in full strength. Both run a temporal course and disappear with or before the sensory or imaginal component. The affective component is never definitely localized, and is usually not localized at all. It is not simply meaning. G. J. Rich (Chicago, Ill.).

701. Buzby, D. E., The Interpretation of Facial Expression. *Amer. J. of Psychol.*, 1924, **35**, 602–604.

Six facial expressions delineated by Pederit (produced on the demonstration model described by Boring and Titchener) were presented to 716 subjects for judgment as to the emotion portrayed. The expressions for Anger and Dismayed gave a wide scatter of judgments, those for Horrified, Disdainful, Disgusted and Bewildered a relatively high consistency of judgment. Analysis showed that the upper part of the face, eye and brow, is more important for correct judgment of facial expression than is the mouth. G. J. Rich (Chicago, Ill.).

5. MOTOR PHENOMENA AND ACTION

702. Bernhard, H., Zusammenfassung der Hauptergebnisse aus den Arbeiten über Körper-, Hals-, Stell- und Labyrinthreflexe. *Monats. f. Psychiat. u. Neurol.*, 1924, **57**, 10–39.

Sehr übersichtliches kritisches Referat. Beiläufig erwähnt Verf., dass nach eigenen Untersuchungen an Gesunden und Kranken eine Gesetzmässigkeit im Bewegungsablauf im Sinn von "induzierten Tonusveränderungen," wie sie von Goldstein beschrieben worden ist, wenigstens bei dem Gesunden nicht vorhanden ist (S. 34 f). Th. Ziehen (Halle a/S.)

703. Tigerstedt, C., and Olin, H., Der Stoffwechsel bei einigen leichteren Beschäftigungen und Gewerben. *Skand. Arch. f. Physiol.*, 1924, **45**, 82–94.

Die Kohlenstoffabgabe wurde bei einer Reihe einfacher geistiger Arbeiten verfolgt: stilles und lautes Lesen unter verschiedenen Bedingungen, Abschreiben, Maschinenrechnen, u. a. Ihre Steigerung gegenüber dem Zustand der Ruhe war um so beträchtlicher, je mehr körperliche Betätigung mit diesen Arbeitsformen verknüpft war. So betrug sie beim stillen Lesen 29 per centum, beim lauten Lesen dagegen 48 per centum. Beim Spielen musikalischer Instrumente war die Zunahme im ganzen sehr viel grösser. Sie erhob sich von 71 per centum Zunahme der Kohlenstoffabgabe beim Spielen des Horns auf 276 per centum beim Spielen der Pauke. Ich gewinne aus diesen Zahlen, und besonders aus dem Vergleich mit der Grösse der Kohlenstoffabgabe bei gewerblicher Arbeit (Schneider, Tischler, Mechaniker) den Eindruck, dass in ihnen nicht die Unterschiede der geistigen Arbeit, sondern die der körperlichen, diese dafür aber besonders scharf, zum Ausdruck kommen. O. Klemm (Leipzig).

704. Atzler, E., Herbst, R., and Lehmann, G., Arbeitsphysiologische Studien mit dem Respirationsapparat. *Biochem. Zeits.*, 1923, **143**, 10–46.

Das Taylorsystem ist unter dem Gesichtspunkte der Physiologie vor allem nach der Richtung hin zu ergänzen, dass die Gesamtarbeit in Elemente zergliedert, und für diese der Kraftverbrauch im einzelnen zuverlässig bestimmt wird. Die Durchführung dieser Aufgabe für die Arbeit des Kurbeldrehens führt zur Kenntnis derjenigen Arbeitsbedingungen, unter denen der am Respirationsapparat nach-

gewiesene Kraftverbrauch ein möglichst geringer ist. Er ergab sich bei einer Achsenhöhe von 114.3 cm. über dem Boden, einer Kurbellänge von 28.4 cm. und einer Arbeitsleistung von 13.0 mkg. je Umdrehung. O. KLEMM (Leipzig).

705. KRONFELD, Zur Phänomenologie des Triebhaften. *Zeits. f. d. ges. Neurol. u. Psychol.*, **92**, 379–400.

Die Arbeit versucht in mustergültiger Weise auf dem Wege introspectiver Selbstbestimmung die wesentlichen Kennzeichen dessen herauszustellen, was man in der Psychologie als triebhaft bezeichnet. Sie grenzt die Triebhaftigkeit gegen Stebungen, Willensphänomene ab, nicht, indem sie irgend eine Definition des Triebes gibt, sondern indem sie dem Gemeinsamen und Unterschiedlichen in den Phänomenen selbst nachzugehen versucht. Die Abgrenzung ist naturgemäss eine indirekte, sie muss auf Ausserpsychologisches, Organzustände, Sinnbeziehungen zurückgreifen; dock ergibt insbesondere die Untersuchung der psychischen Vertretung der Innervationen wichtige und eindeutige Unterscheidungen gegenüber Reflex einerseits und Willkürhandlung andererseits. Bedeutsam ist ferner die Aufstellung des Satzes: "Die Erfolgsvorstellung beim Trieberleben ist nicht, wie bei der gewollten Handlung die *äussere* Bewirkung, sondern der *seelische Eigenzustand;* der tatsächliche Erfolg der Triebhandlungen ist die Erreichung, Festhaltung oder Beseitigung eines Gefühlszustandes." Schliesslich werden der Drang, die Suchten, der Zwang und der Impuls ihrem Wesen nach charakterisiert und als besondere Formen des Triebhaften dargestellt. W. MAYER-GROSS (Heidelberg).

706. HOMBURGER, Zur Gestaltung der menschlichen Motorik und ihrer Beurteilung. *Zeits. f. d. ges. Neur. u. Psychol.*, **85**, 274–314.

Es handelt sich um einen Versuch, das Gesamtbild der menschlichen Motorik im Sinne einer "biologischen Funktionslehre" durch die verschiedenen Lebensalter zu verfolgen und in ihren charakteristischen Merkmalen zu kennzeichnen. H. betrachtet den Körper als ein bewegliches Ganzes und zerlegt seine motorische Ausbildung nach Latenzfristen und Manifestationszeitpunkten. Die Arbeit enthält eint Fülle feiner Beobachtungen und treffender Beschreibungen. H. analysiert zunächst die Mischung von Täppigkeit und Grazie, die dem Kleinkind eigentümlich ist, bespricht sodann eingehend die "plumpe Überflussmotorik der Pubertätsjahre," aus der

sich dann die veredelte Endform nach den Prinzipien der Ökonomisierung und Rationalisierung entwickelt. Tempoverlangsamung und Wegfall der Kombinationsmotorik kennzeichen die Altersmotorik. Die Entwicklung der weiblichen Motorik findet eine gesonderte Darstellung. Die Ergebnisse der inhaltsreichen Arbeit können in einem Referat nicht wiedergegebeg werden. W. Mayer-Gross (Heidelberg).

707. Kompanejetz, S. M., Die Beteiligung des mechanischen Faktors bei der Gegenrollung der Augen. *Arch. f. Ohren-, Nasen- u. Kehlkopfheilk.*, 1924, **112**, 1–11.

An klinischen Fällen wird nachgewiesen, dass es einen mechanischen Faktor für die Gegenrollung der Augen gibt, der auch dann noch ins Spiel treten kann, wenn die reflektorischen Kräfte erloschen sind. Allerdings werden die mechanischen Kräfte nur bei solchen Neigungen des Kopfes wirksam, die 10 bis 20 Grad übersteigen. O. Klemm (Leipzig).

708. Naccarati, S., and Garret, H. E., The Relation of Morphology to Temperament. *J. Abnorm. Psychol., etc.*, 1924, **19**, 254–264.

Previously it has been shown that a positive relation exists between the morphologic index and general intelligence, probably due to action of the endocrine glands. Now it appears that also there is a positive relation between the morphologic index and temperamental or emotional stability, derived from the physical measurements and tests of temperamental and emotional traits. The conclusion can readily be drawn that the endocrines affecting the morphology and mentality very probably influence the emotional life also. "The conclusion from studies in abnormal psychology that temperamental disturbances of an emotional nature are found in those of low m. i. (relatively large trunk and short extremities) more often than in those of high m. i. (relatively small trunk and long extremities) seems to be confirmed tentatively by the results obtained in this study of 54 presumably normal college men." E. F. Symmes (Boston Psychopathic Hospital).

709. Whittemore, I. C., The Influence of Competition on Performance: an Experimental Study. *J. Abnorm. Psychol., etc.*, 1924, **19**, 236–254.

"All subjects turn out more work when competing than when not competing. The average percentile gain is about 26. All sub-

jects do poorer work when competing than when not competing. The homogeneity of the group with respect to speed of performance is the same for competition and noncompetition; with respect to the quality of the work produced it is less under noncompetitive than under competitive conditions. The quality of individual performance fluctuates to a slightly greater degree in noncompetition than in competition. The subjects least capable in speed profit most from competition. On a semi-mechanical task competition tends to emphasize speed rather than quality even when the subjects know that both are important in the total score. Most subjects seem to work slightly faster when coöperating in groups, which in turn are in competition with other groups not present but recognized, than when competing against one another. There is no marked tendency for subjects to do work of a lesser quality when competing in small group units than when competing with one another. Some seem to do better, some slightly worse. Tendencies are probably about equally divided. The homogeneity of the group with respect to the quantity of the work produced is approximately the same under conditions of group and individual competition and with respect to the quality of the work is approximately the same also." E. F. SYMMES (Boston Psychopathic Hospital).

710. SACHSENBERG, E., Neuere Versuche auf arbeitstechnischem Gebiete. Heft 1 der *Ausgewählten Arbeiten d. Lehrstuhles für Betriebswissenschaften in Dresden,* 1924, 1–26.

Eine rhythmische Arbeit, das Verpacken von Zigaretten-Kästchen, wurde durch einen akustischen Rhythmus begleitet. Dabei wurde das Tempo des Rhythmus unter Innehalten der Zeitverhältnisse allmahlich so gesteigert, dass *ein* Rhythmus-Ablauf zuerst 6,9 und schliesslich 3 Sekunden dauerte. Bis zu einem Tempo von 5,6 Sekunden steigerte sich die Arbeitsleistung etwa proportional mit dem Tempo; eine weitere Steigerung bis auf 5,0 Sekunden vermehrt die Arbeitsleistung immer noch, aber nicht mehr proportional. Bei weiterer Temposteigerung wirkt der gegebene Rhythmus als "Gegenrhythmus." Nachdem die Arbeiterinnen durch den Rhythmus zu einer Temposteigerung der Arbeit erzogen sind, hält diese Temposteigerung auch dann noch an, wenn nun kein akustischer Begleitrhythmus mehr gegeben wird. O. LIPMANN (Berlin).

711. Atzler, E., Die Aufgaben der Physiologie in der Arbeitswissenschaft. *Technik u. Wiss.*, 1924, **8**, 173–180.

Atzler verwendet den Betrag, um den die Lungenventilation mit zunehmender Kohlensäurekonzentration ansteigt, als Massstab dafür, wie weit ein Mensch für schwere Arbeit geeignet sei. Ferner sind solche Menschen, bei denen beim Sitzen und Stehen gegenüber dem Liegen die unteren Extremitäten eine beträchtliche Volumzunahme erfahren, für Arbeiten, die mit langem Stehem verbunden sind, ungeeignet. Mit Hilfe von Respirationsversuchen (Feststellung des Sauerstoffverbrauches und der Kohlensäureausscheidung) werden für einige elementare Arbeiten (Kurbeldrehen und Gewichtleben) die optimalen Arbeitsbedingungen (optimale Belastung, optimale Höhe des Kurbelmittelpunktes, optimaler Kurbelradius, optimale Drehgeschwindigkeit; optimales Gewicht, optimale Hubhöhe und Ausgangshöhe) d. h. diejenigen, bei denen ein minimaler Energieverbrauch stattfindet, festgestellt. Zum Schlusse werden einige allgemeine Arbeitsregeln abgeleitet. O. Lipmann (Berlin).

712. Lipmann, O., Arbeitswissenschaft. Die Arbeit, Zeitschrift für Gewerkschaftspolitik und Wirtschaftskunde. Herausg. Th. Leipart. *Verlagsanstalt des Allgemeinen Deutschen Gewerkschaftsbundes,* 1924, **1**, 101–105.

Der etwas verschwommene Begriff der Arbeitswissenschaft wird genau präzisiert als "die Wissenschaft von den Bedingungen, Begleiterscheinungen und Folgen der menschlichen Arbeit," und die einzelnen Komponenten werden aufgezählt und übersichtlich gruppiert. In der Tat verdient dieses Gebiet zur Zeit noch kaum den Namen einer Wissenschaft, denn es liegt nur ein Komplex grossenteils unvollständiger Einzelergebnisse vor, die noch nicht in Beziehung zu einander gesetzt und systematisch geordnet worden sind. Dieser Aufsatz bedeutet einen Schritt vorwärts auf dem Wege zur Entwicklung einer Arbeits*wissenschaft,* zumal der Verfasser sich nicht mit der systematischem Aufzählung begnügt, sondern auch angibt, welche Anforderungen an ein als einwandfrei zu bewertendes Material zu stellen sind. H. Sachs.

713. Eliasberg, W., Grundriss einer allgemeinen Arbeitspathologie. *Zeits. f. angew. Psychol.*, 1924, **24**, 1–41.

Die allgemeine Pathologie der Arbeit ist die Psychopathologie der arbeitenden Persönlichkeit. Die Untersuchung verfolgt die abwegigen Gestaltungen der Wechselbeziehung von Arbeit und Indi-

viduum. Dabei wird das Soziologische streng vom Psychopathologischen geschieden. Die Beziehungen zwischen Arbeit und Erholungstätigkeit werden dargestellt. " Die Affektveränderungen, die das moderne Arbeitsleben setzt, sind im Erlebnis gegenständlich motiviert und sind beherrschbar. Unterliegen pathologische Persönlichkeiten den affektiven Beanspruchungen der Arbeit, so können verschiedene Mischformen auftreten: (a) Unmotivierte Affektspannungen, zu Explosionen neigend, bis zu einem gewissen Grade beherrschbar, in der Arbeit vollwertig. (b) Typus der sittlichen Abstumpfung; die Arbeitsleistung sinkt: Alkoholikertypus. (c) Typus des völlig Verlumpten: 'das Ehrgefühl spricht nicht an.' In der Unfallneurose zeigen sich verständliche Zusammenhänge in der Art derjenigen, die wir aus dem normalen Seelenleben kennen. Es besteht Grund zu der Annahme, dass diejenigen soziologischen Momente, die man in der Unfallgesetzgebung erfasst, nicht die wesentlichen Ursachen für das Zustandekommen der Unfallneurose sind. Die Pathologie der Persönlichkeit zeigt, dass die soziologische Betrachtung der Arbeit und des Berufslebens für sich allein nicht ausreicht. Die kleinsten Typen veränderter Persönlichkeit haben einen wohl bestimmbaren Einfluss auf die Gestaltung der Arbeitsvorgänge. Unter bestimmten Umständen kann Arbeit als Heilmittel wirken. " Sie übt den Willen in der Verwirklichung gesunder Werte. Dazu ist es namentlich in den Grossbetrieben und Heilanstalten notwendig, ihr denjenigen Wert zu erhalten, der für den einfachen Mann der fasslichste ist, nämlich den Lohn." H. Bogen (Berlin).

6. ATTENTION, MEMORY AND THOUGHT

714. Jenkins, J. G., and Dallenbach, K. M., Obliviscence During Sleep and Waking. *Amer. J. of Psychol.*, 1924, 35, 605–612.

The observers in this experiment learned series of nonsense syllables either in the morning or else in the evening just before retiring, and were tested for their memory of the series 1, 2, 4 or 8 hours later. The learning was to complete mastery and the test by the method of retained members. When the series were learned at night, the time between learning and reproduction was spent in sleep; in the other case the observers were awake during the intervening period. The results show a much slower rate of forgetting during sleep than during waking. The curve for forgetting during sleep has a short initial decline, after which a constant level is maintained,

while that for the periods of waking takes the familiar form of a continued decline which is negatively accelerated. This divergence in the rate of forgetting during sleep and waking accounts for the variations found in the curves of forgetting of earlier investigators. G. J. Rich (Chicago, Ill.).

715. Robinson, E. S., Dr. Spencer's Experiment on Retroactive Inhibition. *Amer. J. of Psychol.*, 1924, **35**, 617. G. J. Rich (Chicago, Ill.).

716. Seletzky, W. W., Der Zerfall der Empfindungen und Vorstellungen. *Arch. f. Psychiat. u. Nervenkrankheiten*, 1924, **71**, 144–164.

Sehr interessante Untersuchungen über Störungen und Ausfall einzelner Empfindungsqualitäten und den Zerfall zusammengesetzter Vorstellungen bei Geisteskranken (Schwachsinnigen). Th. Ziehen (Halle a/S.).

717. Herrmann, Selbstbeobachtungen über Spiegelsehen. *Zeits. f. d. ges. Neurol. u. Psychol.*, **92**, 78–83.

Spiegelschrift und Spiegelsprache werden bei den verschiedenartigsten Hirnschädigungen beobachtet, ohne dass es bisher gelang, eine zureichende Theorie der Phänomene aufzustellen. H. teilt swei Selbstbeobachtungen mit, bei welchen von gesunden Personen im Zustand starker Aufmerksamkeitsfesselung oder Ermüdung Aufschriften von rechts nach links (also in Spiegelschrift) gelesen und gesehen wurden. Der erste Beobachter stand auf der Plattform der Strassenbahn in der Fahrtrichtung, der zweite sass ebenfalls in der Fahrtrichtung im Schnellzug, der in die Station einlief. Der Verfasser kommt zu der Auffassung, dass die Reizung des Vestibularapparates durch die passive Bewegung des Körpers während der Fahrt durch cerebrale Vorgänge korrigiert werden entsprechend der cerebralen Gegendrehung gegen die Labyrinthwirkung. Die cerebrale Gegendrehung wirkte in beiden Fällen von rechts nach links, von ihr wurde offenbar die Leserichtung bestimmt. Dass diese cerebrale Gegenwirkung überwog und ihre Tendenz auf die Leserichtung übersprang, erklärt H. aus dem Wegfall der gestaltenden Kräfte infolge der Aufmerksamkeitsfesselung, welche sonst Labyrinthwirkung und cerebrale Gegenwirkung zu dem als "Gestalt" aufzufassenden Koordinatensystem der Gleichgewichtslage vereinigen. W. Mayer-Gross (Heidelberg).

718. Pratt, C. C., The Present Status of Introspective Technique. *J. of Philos.*, 1924, **21**, 225–232.

The psychologists of the Würzburg school directed by Külpe thought they had a device in experimental introspection that had not been fully appreciated. They dispensed with apparatus largely in studying the higher-thought processes. Baird had even greater faith in this method as is shown by Fisher's monograph on the nature of generalized abstractions. In fact Baird put the introspective method to a very severe strain and it broke down under the strain. Ach called attention to the Aufgabe or predisposition of the introspecting observer. Recent psychophysical experimentation has made clear the necessity of careful control of the Aufgabe. Most any phase of experience may be made to stand out if it has been directed to by use of an Aufgabe. The requirement of an univocal determination is necessary if a report is conditioned by several components. Since ability in introspection is not congenital the student must need be trained if he be a novice and quantitative work should be undertaken only if one has had training in qualitative work first. Care in discovering qualitative data will avoid the danger of slipping from one criterion to another. T. R. Garth (Denver).

719. Kurtzig, K., Zur Psychologie des Inserates: Beobachtungswert der verschiedenen Stellen im Aufmerksamkeitsfelde. *Industrielle Psychotechnik*, 1924, **1**, 51–54.

Fortsetzung und Variation der früher von *Starch* unternommenen Versuche über die Stellenwirksamkeit des Zeitungsinserates. Die Aufmerksamkeitswerte für die verschiedenen Plätze einer Seite stellen keine konstanten Grössen dar. Sie sind von dem Format der zur Beurteilung stehenden Seite abhängig. Massgebend scheint in allen Fällen die bestimmte Einstellung der Versuchsperson zu sein, die in unserem Fall nicht auf gewohntes Lesen, sondern auf schnelles Erfassen des Nächstliegenden gerichtet ist. Dass dieses Nächstliegende auf Blättern kleineren oder grösseren Formats nicht identisch ist, wird durch die vorliegenden Untersuchungen nachgewiesen. H. Bogen (Berlin).

720. Sigmar, J., Das Gedächtnis, seine Psychologie und Didaktik. *Handbücherei der Erziehungswissenschaft*, 1924, **9**, 239.

Sigmar gibt einen Ueberblick über die Forschungsergebnisse und die Theorie des Gedächtnisses und über die didaktische Pflege des

Gedächtnisses und berücksichtigt dabei auch modernere Theorienbildungen, z. B. die Gestaltpsychologie und die Eidetik. Das Buch ist in erster Linie für den Gebrauch als "Textbuch" bestimmt, und es sind daher vielen Abschnitten Uebungsaufgaben angefügt; ein eingehendes Literatur-, Namen- und Sachverzeichnis gestatten aber auch seine Verwendung als Nachschlagewerk. O. Lipmann (Berlin).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

721. Böhmig, W., Der schaffende Künstler und sein Werk. *Arch. f. Psychiat. u. Nervenkrankheit.*, 1924, **71**, 709–734.

Interessante Bemerkungen über den Vorgang der künstlerischen Konzeption mit zahlreichen, zum Teil noch wenig bekannten Belegen aus der poetischen und musikalischen Literatur. Th. Ziehen (Halle a/S.).

722. Galant, J. S., Ungewöhnliche Störungen der Persönlichkeit. (Das Phänomen der illusionierten Persönlichkeit.) *J. f. Psychol. u. Neurol.*, **30**, (5/6), 270.

Das Phänomen, von dem hier die Rede ist, besteht darin, dass dem Kranken eine fremde Persönlichkeit zwangsweise aufgepfropft scheint. Es dauert lange an und geht schliesslich so unerwartet verloren, wie es unerwartet aufgetreten war. Es tritt scheinbar nur im Anschluss an schwere Dämmerzustände auf, wo die Bedingungen für eine Depersonalisation gegeben sind. Die Anomalien sind dann besonders qualvoll, wenn der Kranke bei jeder unschuldigen Bewegung, bei jedem Blick auf seinen Körper die fremde Person erkennt. W. Riese (Frankfurt a/M.).

723. Talbert, E. L., On the Mental Level Implied in Primitive Technique. *J. of Philos.*, 1924, **21**, 232–235.

Levy-Bruhl drawing his conclusions largely from missionary reports concludes that primitive men do not regard the good and bad behavior of things as depending on their construction and their properties. Spirits are the causes of success and these operate in charms, omens, curses, etc. With the savage no natural causes exist. Levy-Bruhl also admits the importance of technique, and he sees the importance of careful study of tools, inventions, and economic processes by American anthropologists. Though the primitive's adaptation of things as tools to situations appears admi-

rable still there is here nothing more than of immediate perceptual adjustment. Sound as Levy-Bruhl's generalizations may be there will probably later appear a necessity to change his emphasis. There is some question as to whether the primitives give to the missionaries the true explanation as they themselves understand it. There are instances of primitive skepticism which are clearly relevant in this connection, as Stanley's and Sheppard's experiences certainly show. Primitive society without doubt shows a realistic appreciation and manipulation of human nature, and there is political technique as well as remarkable insight into human character. Here primitive technique often has a measure of the secular. Behaviorism favors the view that artefacts of early men were more or less accidental successes as is analogous to a cat's chance opening of a door to a puzzle box. It is more than likely that Levy-Bruhl underestimates the level of primitive mentality in the making and using of artefacts. Productive imagination is taken away from the inventor and maker of artefacts and is generously bestowed upon the primitive myth-maker. We find here Freudian bias as well as behavioristic persuasion. T. R. GARTH (Denver).

724. BURROW, T., Social Images Versus Reality. *J. Abnorm. Psychol., etc.*, 1924, **19**, 230–236.

The doctrines of relativity bears directly on psychology in the consideration of absolute values. Observation by man is unconsciously limited, and the reality of the world about him is excluded in the preoccupation with his own image and its reflections embodying a mechanism whereby man unconsciously substitutes a vicarious social image derived from a "group or syndicate form of mental imagery as contrasted with the isolated mental imagery of the individual." The mother-image can thus be analyzed as formed of reflections by the mother of the social environment and transmitted to others through individual reflection. As the mother's approval is sought, so the approval of the community is sought, but "this fetish of our social image worship is no more recognizable by us in the absence of conditions that make possible an analysis of the social mind as it exists within each of us than it is possible for us to recognize the fetish of our personal images as they exist within the unconscious of our individual minds." "To form a conception of our unconscious mass mind and its social condensations it is required that we forego our present absolute basis of evaluations residing in the private judgment of the individual and that instead we assume

a basis which being relative to and inclusive of our mental and social processes will envisage both on the basis of a more universal and encompassing evaluation." E. F. SYMMES (Boston Psychopathic Hospital).

725. WALTHER, A., Zur Typologie der Kulturen. *Kölner Vierteljahrshefte für Soziol.*, 1924, 4.

Beginnt man mit den Individuen, so erhalten wir als ein erstes Hauptkapitel der Kulturtypologie das der psychologischen Kulturtypen, welches zum Teil mit rer Völkerpsychologie zusammenfällt, allerdings nicht im Sinne von Wundt, sondern im Sinne einer vergleichenden, differentiellen Betrachtung der Charaktere der Völker. Prinzipiell entspricht jedem Menschentypus ein Kulturtypus: dem Verstandesmenschen eine Verstandeskultur, dem impressionistischen eine impressionistische, dem faustischen Menschen eine faustische Kultur. Diese Entsprechung bedeutet freilich nicht immer, dass eine aus bestimmt disponierten Menschen zusammengesetzte Kultur nun auch als Ganzes den Charakter ihrer Einzelglieder zeigt. Das amerikanische Volk ist keineswege aus besonders enthusiastisch angelegten Menschen zusammengesetzt und hat doch eine enthusiastische "Kollektivpsyche." Wichtige Kapitel sind die: Umwelttypen, die Gruppentypen und die Kulturgebietstypen. P. PLAUT (Berlin).

726. MEUSEL, A., Der Radikalismus. *Kölner Vierteljahrshefte für Soziol.*, 1924, 1.

Ein Beitrag zur Beziehungslehre und zur Psychologie der Revolution. Wenn man die Masse nicht als ungegliedertes Chaos betrachtet, sondern geteilt in Menschen verschiedener Altersstufen und verschiedenen Geschlechts, so ist die Vorherrschaft des Gefühls über den Verstand bei niemand deutlicher als bei den Frauen und Jugendlichen wahrnehmbar, und in diesen Gruppen findet sich das eigentliche Gebiet des Radikalismus. Verfasser analysiert diesen im Einzelnen aus formal soziologischen Gründen, die politisch stark eingefärbt sind und das psychologische Moment vermissen lassen. P. PLAUT (Berlin).

727. STOLTENBERG, H. L., Vierkandts Lehre vom Kollektivbewusstsein. *Kölner Vierteljahrshefte für Soziol.*, 1924, 4.

Eine kritische Auseinandersetzung mit Vierkandts *"Gesellschaftslehre"* unter Hinweis auf Stoltenberg's Bücher: Soziopsy-

chologie und Psychosoziologie. Bemängelt werden in der Hauptsache die unklaren Formulierungen Vierkandts. Diese kritischen Auseinandersetzungen sind sehr unglücklich ausgefallen, da Stoltenberg bekanntlich Begriffe einführen will, die wie z. B. "Gruppgemeinbewusstsein" und Eigengruppgemeinbewusstsein mehr eine Vergemaltigung der Sprache bedeuten als dazu angetan sind, klare Begriffe herauszuarbeiten. P. PLAUT (Berlin).

728. KAINZ, F., Das Steigerungsphänomen als künstlerisches Gestaltungsprinzip. Eine literarpsychologische Untersuchung. *Zeits. f. angew. Psychol.*, 1924, Beiheft **33**, 145.

Diese Untersuchung stellt sich die Frage: Wie vollziehen sich die Umsetzungen und Umformungen, die aus dem Komplex der aussenweltlichen Eindrücke ein Kunstwerk gestalten? Und: lässt sich in diesem Prozess der Umsetzung und Umwertung eine gewisse Gesetzmässigkeit feststellen, und worin besteht diese Gesetzmässigkeit? Verfasser untersuch zunächst den Begriff der Steigerung und deren psychische Wurzel. Diese ist eine allgemeine menschliche Seelenfunktion, die auf ein psychisches Bedürfnis zurückgeht; ja sie ist eine elementare Determination der seelischen Grundfunktionen überhaupt. Das menschliche Bewusstsein ist auf Umformungen eingestellt und diese Umformungen gehen in steigerndem Sinne vor sich. Aus diesem Ausdrucksbedürfnis erwächst als zweite Wurzel das Gestaltungs- und Formungsverlangen, das für den Künstler eine besondere Wichtigkeit gewinnt, da ja das Bedürfnis und die Fähigkeit des Gestaltens den Künstler vom Nicht-Künstler unterscheidet. Verfasser gibt unter Beifügung eines reichen Materials folgende Abstufungen der Steigerung. 1. Steigerung in vorwiegend ausserästhetischen Verwendung (Uebertreibung), wirksam im Alltagsleben. Kennzeichen: Stofflichkeit, direkte Wirkung. Der Steigerungsprozess selbst oder das sich daraus ergebende Grössenverhältnis wird lustvoll genossen. 2. Uebergangsformen der Steigerung: Karrikatur, Parodie, Travestie, Tendenzdichtung, primitive Literatur. 3. Steigerung in vorwiegend ästhetischer, künstlerischer Verwendung. Hauptkennzeichen: Entstofflichung, keine vorwiegend materiell-direkte Wirkung. Die Steigerung wirken vorwiegend indirekt als Bestandteile eines kunstvoll gegliederten Aufbaues. Steigerung ist hier nicht Selbstzweck, sondern Mittel zu einem künstlerischen Zweck. (Komposition, Architektonik in formaler Problemvertiefung, usw., in inhaltlicher Hinsicht. P. PLAUT (Berlin).

729. Sippel, H., Biopsychologie und Leibesübungen. *Monatssch. f. Turner, Spiel und Sport,* 1924, 221–227.

Der Verfasser bezeichnet als Aufgabe der körperlichen Erziehung die Kräftigung des Körpers durch Uebung zu Werterlebnissen zu führen. Sie hat das Ziel, Leib und Seele zur harmonischen Persönlichkeit zusammenzuschliessen. Die Werterlebnisse der einzelnen Persönlichkeiten kristallisieren sich in bestimmten Richtungen. Die Leibesübungen sind der Erlebnisrichtung des Individuums anzupassen, sodass also der ökonomische Mensch die Leibesübungen unter Zweckgesichtspunkten zu übernehmen gewöhnt wird. Entsprechend sind die Leibesübungen auf den sozialen, den Macht-, den ästhetischen, theoretischen und religiösen Menschen abzustimmen. H. Bogen (Berlin).

730. Greiveldinger, N., Die Bedeutung der Gleichförmigkeit für das Wirtschaftsleben. *Industrielle Psychotechnik,* 1924, 1, 42–47.

Der Zweck des vorliegenden Aufsatzes besteht darin, im Anschluss an die Gleichförmigkeit des Geschehens in Natur und Kultur, wie sie auf vielen Gebieten besonders durch *Marbe* nachgewiesen ist, die Bedeutung dieses Phänomens für das Wirtschaftsleben in grossen Zügen darzutun. H. Bogen (Berlin).

731. Halberstaedter, H., Psychotechnische Organisationslehre: Grundsätze der Ressortbildung. *Industrielle Psychotechnik,* 1924, 1, 47–51.

"Die Arbeitsteilung der gehobenen Angestellten darf nicht willkürlich und zufällig erfolgen, sondern nach psychologischen Gesichtspunkten. Auf Grund psychologischer Analyse der einzelnen Arbeitsfunktionen sind diese zu einem Tätigkeitsbereich zusammenzufassen. Die Organisation muss darauf Rücksicht nehmen, dass kein Posten unerfüllbarre Anforderungen an Fähigkeiten und Charakter stellt." H. Bogen (Berlin).

732. Schulhof, A., Die Darstellung psychotechnischer Prüfergebnisse. *Industrielle Psychotechnik,* 1924, 1, 54–58.

"Es werden an Hand der Entwicklung die wichtigsten Darstellungsweisen der psychotechnischen Prüfung gezeigt. Im Cartesischen und Polarkoordinatensystem werden die Befähigungsmasse mittels Punkten, vertikaler oder horizontaler Geraden, Kreisbogen, Rechteckflächen, Kreissektoren dargestellt. Die Leistungsmasstäbe werden

bezogen auf statistische Mittelwerte des Milieus, auf ein Bewahrungsmass oder auf das Niveau des jeweiligen Angebotes." H. BOGEN (Berlin).

733. FLOCKENHAUS, M., Die geistige Leistungsfähigkeit nach schwerer körperlicher Anstrengung. *Monatssch. f. Turnen, Spiel, und Sport,* 1924, 26–28.

Der Vergleich von Durchstreich- und Additionsleistungen vor und nach einem Marathonlauf zeigt eine bedeutende Steigerung der geistigen Leistung nach dem Lauf. Fl. glaubt den Zustand von Willensanspannung und Erregung für diese Mehrleistung verantwortlich machen zu müssen. H. BOGEN (Berlin).

734. STRUBE, F., Der Einfluss des Boxens und seiner Vorbereitung auf die Geschicklichkeit der Hand. *Monatssch. f. Turnen, Spiel und Sport,* 1924, 172–174.

Geschicklichkeitsleistungen der Hand werden vor und nach gymnastischen und Boxübungen kontrolliert. Die über längere Zeiträume sich erstreckende Beobachtung erweist die günstige Wirkung insbesondere des Boxens auf die Handgeschicklichkeit. H. BOGEN (Berlin).

735. SCHULZE, O., Psychologische Grundlagen für Wirtschaftsgesundung und Produktionssteigerung. *Organisation,* 1924, 26, 43–49; 78–81.

Bei Versuchen zur Steigerung der Produktion ist das Augenmerk in erster Linie auf die psychologisch zu erklärende Wechselwirkung zwischen der Psyche des Individuums und der Politik der Prosperität der einzelnen wirtschaftlichen Organisation, in deren Dienst es steht, und auf die Resultate dieses Verhältnisses nach der Negativ- und Positivseite hin zu richten. Neben allen organisationstechnischen Leistungen moderner Wirtschaftsbetriebe hat die Berücksichtigung der seelischen Einstellung des Arbeiters zur Arbeit herzugehen. Das Psycho*technische* darf nicht auf Kosten des seelisch-*Empfindenden* ausgebaut werden. Der fortschreitenden Entseelung der Arbeit durch Spezialisierung, Normisierung und Typisierung hat die Belebung der Arbeit- und Berufsfreude parallel zu gehen, wenn nicht nur vorübergehende Mehrleistungen erzielt werden sollen. Da der Mensch von Natur aus faul ist, muss diesem natürlichen Trägheitsmoment entgegengewirkt werden. So muss der Nivellierung der gelernten und ungelernten Arbeiter im Lohnsatz

Einhalt geboten werden, die Erziehung der Jugend hat sich vor der Züchtung eines zu starken Individualismus' zu hüten. Die Sozialpolitik darf nicht nur immer Rechte geben, sondern für jedes gegebene Recht gleichzeitig Pflichten auferlegen: Eine wesentliche Komponente der Steigerung des Arbeitswillens ist die Verminderung der Reibungsflächen zwischen Unternehmer und Arbeitnehmer innerhalb des Betriebes durch sozial-fürsorgerische Massnahmen, die vor allen Dingen eine Mehrung und Ausgestaltung der wirtschaftlichen Befriedigungsmittel des Arbeiters zum Ziel haben, sodass dadurch eine Hebung des Glücksgefühls des Arbeitnehmers gewährleistet wird. Im Dienste dieser Aufgabe hat sich auch in erster Linie die Arbeitervertretung innerhalb des Betriebes zu betätigen. H. Bogen (Berlin).

736. Schultze, E., Organisatorische Völkerbegabung. *Organisation,* 1924, **26**, 114–116.

Vergleichende Betrachtungen verschiedener Völker führen den Verfasser zur Ablehnung des Begriffs organisatorischer *Begabung.* Es darf nur von organisatorischen Leistungen gesprochen werden. Die Geschichte zeigt, dass ein Volk solange zu organisatorischen Leistungen in der Lage ist, wie es von sittlichem Wertgehalt erfüllt ist. Die Emporentwicklung der Völker über organisationstechnische Massnahmen hinweg ist damit erst dann ermöglicht, wenn sich die Völker vor der Verarmung an Kulturidealen schützen. Da jedes Volk Tiefen und Höhen kulturideal-erfüllter Zeiten erlebt, die mit dem Rhythmus anderer Völker nicht zusammenfallen, so sind die einzelnen Nationen vor der Idealverarmung durch gegenseitige Befruchtung mit den anderen Völkern eigenen Idealen zu schützen. H. Bogen (Berlin).

737. Riedel, Zur arbeitstechnischen Durchbildung des Förderwesens. *Organisation,* 1924, **26**, 186–189.

Es wird ein kurzer Ueberblick über die Beanspruchung des menschlichen Körpers im Förderwesen bei Eigenbewegung des Menschen, bei der Förderung mit Fahrzeugen und beim Tragen gegeben. Die volle Ausnutzung arbeitstechnischer Vervollkommnungen des Fördergeräts ist nur bei sorgfältiger Ausbildung des Arbeiters gewährleistet. Diese hat sich nicht nur auf das Eindrillen richtiger Arbeitsweisen zu erstrecken, sondern vor allen Dingen auf die Erweckung des Verhältnisses für richtige und falsche Arbeitsweise. In Anbetracht erhöhter intellektueller Anforderung an den

Transportarbeiter ist es falsch, als solche nur diejenigen zu verwenden, die sich zu anderen Verrichtungen nicht eignen. H. Bogen (Berlin).

738. Couvé, R., Die Psychotechnische Versuchsstelle der deutschen Reichsbahn. *Organisation*, 1924, **26**, 197–199.

Schildert Aufgabenbereich, Organisation und Arbeitsergebnisse. H. Bogen (Berlin).

739. Brandt, T., Mensch und Werkstatt-Transport. *Organisation*, 1924, **26**, 208–211.

Untersuchungen über die beim Förderkarren-Transport aufzuwendende Zug- und Stosskraft bei verschiedener Bodenbeschaffenheit und Beschuhung, sowie über die zum Anfahren eines Karrens erforderliche Kraft. Die aufzuwendende Kraft erweist sich in erster Linie von objektiven Verhältnissen abhängig, nämlich vom Verhältnis des Raddurchmessers zur Höhe der zu überwindenden Bodenunebenheit. H. Bogen (Berlin).

8. SPECIAL MENTAL CONDITIONS

740. Hauptmann, A., Menstruation und Psyche. (Versuch einer "verständlichen" Inbeziehungsetzung somatischer und psychischer Erscheinungsreihen.) *Arch. f. Psychiat. u. Nervenkrankheiten*, 1924, **71**, 1–54.

Verf. hat von Studentinnen, die über genügende psychiatrische Kenntnisse verfügten, ausführliche Fragebogen bezüglich ihrer psychischen Veränderungen während der Menstruation anonym ausfüllen lassen. Mit einem Teil der Versuchpersonen fanden auch mündliche Besprechungen statt. Auf Grund der Beobachtungen glaubt er fünf Gruppen aufstellen zu können. In *einem* sonst normalen Fall nahmen die Vorstellungen während der Menstruation zum Teil sinnliche Lebhaftigkeit an (es bestand Neigung zu kunstwissenschaftlicher Beschäftigung!). Besonders interessant sind die Vpp. der 4 Gruppe, die während der Menstruation *paranoische Reaktionen* zeigten, ohne dass ausserhalf der Menstruationszeit eine Praedisposition zu paranoischen Auffassungen ihrer Erlebnisse bestand, und ohne dass ein Keim zu eigentlichen paranoischen Psychosen bei ihr selbst oder in ihrer Familie vorlag. Verf. meint, dass solche Erscheinungen nicht mit menstruellen Beschwerden und auch nicht mit endokrinen Einflüssen der Menstruation, sondern "nur mit der

Tatsache der Menstruation zusammenhängen (Veränderung des "Ichgefühls," "das mehr unterbewusste, periphere Wissen um die Tätigkeit der Sexualorgane und infolgedessen veränderte Einstellung zur Umwelt"). Bei einigen dieser Vpp. war zugleich die Libido während der Menstruation gesteigert. Verf. meint, dass diese als solche nicht zu den paranoischen Reaktionen führt, sondern erst durch den mit der Steigerung der Libido verknüpften moralischen Konflikt, Wesentlich bleibt das veränderte Ichgefühl, und dies soll nicht endokrinen Einflüssen auf das Nervensystem entsprechen, sondern "das *psychische Subjekt,* die Persönlichkeit, zu der ja auch das Bewusstsein ihrer Körperlichkeit gehört, empfindet *die an seinem Körper* vorsichgehende Veränderung und erfährt damit auch eine Umgestaltung seines Ichgefühls." In einer 5 Gruppe, bei der menstruale Verstimmungszustände (Depression, usw.), im Vordergrund stehen, gibt Verf. "eine körperliche Provenienz" zu, bestreitet aber auch in diesen, seiner Meninung nach seltenen Fällen dass irgendwelche *spezifische* Produkte die menstruelle Depression hervorbringen, sondern behauptet, dass die Menstruation nur "*eine* der Austosskräfte für gewisse bei derart Veranlagten parat liegende Mechanismen darstellt." Er stützt sich namentlich darauf, dass bei diesen Personen andere körperliche Einflüsse die gleiche Wirkung haben. Besonders betont Verf. auch die Verstärkung gewisser konstitutionell bereits vorhandener Charakterzüge wie z. B. Eifersucht, Selbstsucht, während der Menstruation. In anderen Fällen erscheint der körperliche Vorgang als der "*Aktivator* einer latenten psychischen Anlage" (vgl. über diese speziell psychiatrischen Fragen das Original). Th. Ziehen (Halle a/S.).

741. Köhler, J., and Roos, C., Einige Versuche über das sogenannte Gedankenlesen. *Skand. Arch. f. Physiol.*, 1924, **45**, 74–81.

Die Vp. erhielt die Aufgabe, an eine bestimmte Zahl zwischen 5 und 100 zu denken. Dann fing der Vl. an von 1–100 zu zählen. Gleichzeitig wurde die Atmung der Vp. registriert. In fast sämtlichen untersuchten Fällen zeigte sich in der Atmung eine sehr deutliche Symptomatik, sobald die kritische Zahl ausgesprochen wurde. Die Verf. meinen, dass bei hinreichender Übung jeder normale Mensch ohne Hilfe von Registrierapparaten diese Veränderungen der Atmung beobachten, und auf diese einfache Weise ein "Gedankenlesen" ausüben könne. Leider aber haben sie diesen einfachen Versuch selbst nicht ausgeführt. O. Klemm (Leipzig).

742. Lindroth, C. E., and Westerlund, O., Über die Einwirkung des Alkohols auf die Pulsfrequenz. *Skand. Arch. f. Physiol.*, 1924, **45**, 156–165.

Die zu den Versuchen dienende Alkoholmenge von 10 bis 50 c.cm. wurde mit zwei Teilen Wasser verdünnt nach einer langen Vorperiode von durchschinttlich 45 Minuten, während deren dauernd der Puls registriert wurde, vorsichtig durch Saugen an einer Glasröhre aufgenommen. Sie rief auch bei vollständiger körperlicher Ruhe während etwa einer halben Stunde eine Steigerung der Pulsfrequenz hervor. Diese Steigerung betrug aber nicht mehr als höchstens 2 bis 4 Schläge pro Minute. O. Klemm (Leipzig).

743. Serog, M., Die Suggestibilität, ihr Wesen und ihre experimentelle Untersuchung nebst einer neuen Methode der Suggestibilitätsprüfung. *Zeits. f. d. ges. Neurol. u. Psychol.*, **88**, 434–439.

Angabe einer neuen Methode mittels Hautreizung durch den elektrischen Strom die Suggestibilität der Versuchspersonen festzulegen, durch Suggerierung eines nicht objektiv wirksamen Stromes oder von objektiv nicht vorhandenen oder objektiv gegensätzlichen Stromschwankungen. Die gebotene Theorie der Suggestion läuft im Wesentlichen auf eine Festlegung der Suggestibilität als einer primitiven und primären psychischen Funktion hinaus. Verfasser hält sie für eine der ersten Manifestationen alles Psychischen überhaupt. H. Brüger (Heidelberg).

744. Fauser und Ottenstein, Chemisches und Physikalisch-Chemisches zum Problem der "Suchten" und "Entziehungserscheinungen," insbesondere des Morphinismus und Cocainismus. *Zeits. f. d. ges. Neurol. u. Psychol.*, **88**, 89–128.

Wesentlich im Hypathetischen bleibende Arbeit, die letztlich Anregung sein will. Die Verfasser vermuten hinter den Entziehungserscheinungen und Suchten, speziell des Morphiums und Cocains, eine Störung des Ionengleichgewichts der Zelle und bringen die längere Zeitspanne zwischen Abstinenz und Eintreten der Entziehungserscheinungen bei Morphium mit der experimentell nachgewiesenen schwereren Membrandurchwanderung des M. relativ zum Kokain in Verbindung. Experimentelle Grundlagen für ihre Hypothesen stellen die Verfasser in Aussicht. H. Brüger (Heidelberg).

745. Beringer, Experimentelle Psychosen durch Mescalin. *Zeits. f. d. ges. Neurol. u. Psychol.*, **84**, 426–433.

Es handelt sich um eine kurze vorläufige Mitteilung aus einer grossen Reihe von Versuchen an der Heidelberger Psychiatr. Klinik mit dem Alkaloid einer mexikanischer Kakteenart, von dem schon lange bekannt ist, dass es Räusche mit Sinnestäuschungen erzeugt. B. geht nicht näher auf die Halluzinationen ein, sondern teilt zwei Selbstschilderungen mit Meskalin vergifteter Versuchspersonen mit, aus denen hervorgeht, dass auf dem Höhepunkt des Rausches Zustände von durchaus psychotischem Charakter erlebt werden, in welchen schwer beschreibbare abnorme Gefühlszustände vorherrschen. Diese werden als ungeheuer bedeutungsvoll, "neuwertschöpferisch" empfunden und auch zum Teil nach Abklingen des Rausches religiös und weltanschaulich verwertet. Von besonderem Interesse ist der trotz allem Gefühlsüberschwang stets vorhandene Drang zur Selbstbeobachtung, der als störend und unangenehm empfunden wird. W. Mayer-Gross (Heidelberg).

746. Morgenstern, Beitrag zur Frage des Belladonnadelirs. *Zeits. f. d. ges. Neurol. u. Psychol.*, **82**, 231–239.

M. schildert zwei Fälle von Delir nach Tollkirschenvergiftung: plötzlicher Ausbruch mit starker Erregung, stürmischer Verlauf, tiefe Verwirrtheit, Affektlage ängstlicher Ratlosigkeit, Halluzinationen des Gesichts und der Körpergefühle. Die beiden Fälle weisen aber auch erhebliche Unterschiede auf, und es werden die konstitutionellen und konstellativen Einflüsse erörtert, die für diese Unterschiede verantwortlich gemacht werden können. W. Mayer-Gross (Heidelberg).

747. Grafe und Mayer, Über den Einfluss des Affekts auf den Gesamtstoffwechsel. *Zeits. f. d. ges. Neurol. u. Psychol.*, **86**, 247–253.

Die Autoren haben gesunden Vpn. in der tiefen Hypnose in der Hauptsache depressive Affekte suggeriert und in der Mehrzahl der Fälle eine Erhöhung des Gesamtstoffwechsels im Durchschnitt um 7.6 per centum, im einzelnen bis maximal 25 per centum festgestellt. Beschleunigung von Puls und Atmung, die nach Möglichkeit gleichfalls suggestiv verhindert wurden, geben dafür keine Erklärung, es bestand völlige motorische Ruhe, alle anderen Fehlerquellen wurden ausgeschaltet. So dass in der Tat nachgewiesen ist, dass der Affekt selbst die Sorge, "zehrt." Inwieweit es sich dabei um eine Erhöhung

des Gehirnstoffwechsels oder des Stoffwechsels des gesamten Organismus handelt, bleibt offen. W. MAYER-GROSS (Heidelberg).

748. RATNER, J., De-Moralizing Freud. *J. of Philos.*, 1924, **21**, 113–117.

Freudian psychology in spite of its many faults such as its exaggerations, inaccuracies, mythologies, is valuable because it has placed emphasis where others have neglected to do so. However, because it is now so largely a " cult " it is difficult to know its future. Unfortunately Freud made use of terminology of more or less uncertain scientific meaning to his readers. His least offense in this direction is the use of the word " sublimation " but this was soon involved and with embarrassment to itself with " censor " and " suppressed desires." Nobody likes a censor. Nobody likes to be suppressed. We in our life's experience have regretted being suppressed or thwarted. Unfortunately such notions place the individual on the wrong side of the fence with regard to himself. Instead of continuing to suppress where he should really suppress for the sake of his own integrated individuality, there is a temptation to lift the suppression. " Dream psychology " would lead one to regard his original nature as very bad when in fact it should only control and at the same time cherish. The terms compensation, rationalization, defense-mechanism seem to have contracted a moral connotation and convey that instead of scientific diagnosis. In fact in making sex the only fundamental characteristic of human nature Freud is involved in the contradiction of even hindering that trait in its natural functioning. T. R. GARTH (Denver).

749. MÜHL, A. M., Automatic Writing Combined with Crystal Gazing as a Means of Recalling Forgotten Incidents. *J. Abnorm. Psychol., etc.*, 1924, **19**, 264–274.

In addition to the use of automatic writing in recalling forgotten incidents and bringing to light conflicts, the use of crystal gazing with involuntary writing has been found valuable. It provides a combination method with verbal and visual imagery, and is excellent for " draining a child's phantasy life, especially in the case of those children whose day-dreaming is interfering with their school work." These so-called percept images appear to vanish entirely with increasing age. Restricted to memory pictures, and used constructively under supervision of a well trained psychiatrist, these images are useful, but with inadequate direction they tend to " produce a break-

ing up of any well synthesized mental state." E. F. Symmes (Boston Psychopathic Hospital).

750. Slight, D., Hypnagogic Phenomena. *J. Abnorm. Psychol., etc.*, 1924, **19**, 274–283.

Dream problems might be better understood if hypnagogic phenomena could be observed, inasmuch as they are of the same nature as the dream, but more accessible to introspection, and the records made in the hypnagogic state are more in accord with the actual state during the dream, which state, however, can never again be fully achieved. The interpretations, therefore, of these states bear more marks of reality and surety. The phenomena cited and the interpretations made reveal the author's view of Freudianism. He criticizes static symbolisms as destroying the wholeness of the context, stressing the fact that sometimes the image may have a real meaning. Neither the censor of the Freudians nor Rivers' explanation of the dream as infantile type of thought is accepted but as "in waking life the thought processes are adapted to meet real and practical ends, in sleeping and similar states the undirected or phantastic thinking has to satisfy affective states or trends and these alone." Forgetting of dreams can be explained without recourse to the activity of a censor by the type of production which it is, "new, bizarre, and fleeting, where there is no reason why we should remember more than isolated scraps unless a written record is immediately made." E. F. Symmes (Boston Psychopathic Hospital).

751. Hellwig, A., Okkultismus und Wissenschaft. *Arch. f. Krim.*, 1924, **76**, 196–202.

Es ist unmöglich, durch das Studium von Sitzungsberichten eine begründete zuverlässige Ueberzeugung von der Echtheit parapsychischer oder paraphysischer Erscheinungen zu gewinnen. Ein zuverlässiger Gewährsmann ist nur der, der weder von vornherein von der Tatsächlichkeit derartiger Phänomene überzeugt ist, noch eine vollkommen negative Einstellung hat. Daraus dass Bedingungen unter denen sich die ungewöhnlichen Erscheinungen zeigen, bei den einzelnen Medien verschiedene sind, kann man keinen grundsätzlichen Einwand gegen ihre Echtheit herleiten. Ueberzugend sind nur solche versuche, die als wissenschaftlich exakt angesehen werden können. Ist die Veranstaltung solcher Versuche unmöglich, dann gehört das Gebiet der Parapsychologie und Paraphysik in das der Glaubens. O. Lipmann (Berlin).

9. NERVOUS AND MENTAL DISORDERS

752. Kolle, K., Der Körperbau der Schizophrenen. *Arch. f. Psychiat. u. Nervenkrankheit.*, 1924, **72**, 40–88.

Verf. weist nach, dass die von Kretschmer u.a. vorgenommene Aufstellung und Abgrenzung von Körperbautypen in vielen Beziehungen problematisch ist. "Es wird hier eben immer vom guten Willen des Einzelnen abhängen, ob er die Typen sehen will oder nicht." Der "pyknische Typ" beispielsweise zerfällt sehr oft, sobald man eine exakte Darstellung durch Masse und Merkmale verlangt. Noch ungünstiger sind die Ergebnisse des Verf.'s bezüglich der Kretschmer'schen Behauptung, dass eine biologische Affinität bestimmter Körperbauformen zu bestimmten Psychosen resp. charakterologischen Veranlagungen besteht. Er weist im Besonderen zahlenmässig nach, dass für das von ihm untersuchte Material (Mecklenburger) eine solche Affinität bestimmter Körperbaugruppen zur Schizophrenie sicher nicht vorhanden ist. Ebenso verwirft er, übrigens wohl mit vielen namhaften deutschen Psychiatern, die Kretschmersche Hypothese schizothym-schizoider resp. zyklothym-zykloider Charaktere im Bereich des Normalen. Die Beziehung zwischen Körperbau und Charakter resp. Temperament ist also von Kretschmer nicht gelöst; seine Lehre "verschleiert mit pseudowissenschaftlicher Exaktität die Probleme." Th. Ziehen (Halle a/S.).

753. Galant, J. S., Was ist Ameisenlaufen? *Deuts. Z. f. Nervenheilkunde*, 1924, **81**, 283–286.

Verf. betrachtet die als Ameisenlaufen bezeichneten Paresthesien als eine zusammengesetzte Erscheinung, in deren Mittelpunkt in den schwereren Fällen spezifische, auf Sympathicusfasern zu beziehende punktförmige Schmerzempfindungen stehen. Daneben sollen auch motorisch und sensible Nervenfassern in einer nicht ganz klaren Weise beteiligt sein. Th. Ziehen (Halle a/S.).

754. Forster, E., Linsenkern und psychische Symptome. *Monats. f. Psychiat. u. Neurol.*, 1923, **54**, 215–244.

Bei der epidemischen Encephalitis lethargica treten oft psychische Störungen auf. Da nun diese Krankheit vorzugsweise im Linsenkerngebiet und seiner Umgebung lokalisiert ist, erhebt sich die Frage, ob das Linsenkerngebiet zu psychischen Prozessen in Beziehung steht. Auf Grund eigener Beobachtungen und der Fälle in der Literatur

kommt Verf. zu einem negativen Ergebnis. Wenn sich gelegentlich Symptome eines geistigen Defekts finden, so ist dies auf eine Beteiligung der Rinde zurückzuführen. Richtig ist nur, dass psychische Faktoren, besonders Affekte, in solchen Fällen einen besonders starken Einfluss auf die Intensität der körperlichen Erscheinungen (motorischen Symptome) haben. TH. ZIEHEN (Halle a/S.).

755. POPHAL, R., Das Gesetz der spezifischen Energie und das biologische Grundgesetz in Anwendung auf die Psychiatrie. *Monats. f. Psychiat. u. Neurol.*, 1924, **57**, 63–80.

Theoretische Erörterungen über die Bedeutung ungewöhnlicher und daher krankmachender Reize und der spezifischen Organisation der von den Reizen betroffenen Organe für die Unterscheidung von Krankheitsformen und Krankheitstypen in der Psychiatrie. TH. ZIEHEN (Halle a/S.).

756. GOLDSTEIN, K., Ueber die Abhängigkeit der Bewegungen von optischen Vorgängen. Bewegungsstörungen bei Seelenblinden. *Monats. f. Psychiat. u. Neurol.*, 1923, **54**, 141–194.

Verf. zeigt an der Hand zweier Fälle, dass sich bei Sellenblindheit sehr ausgesprochene Störungen des Handelns finden können, die direkt als Folge der Störung im optischen Gebiet zu betrachten sind. Besonders gestört erweisen sich die isolierten Willkürhandlungen; der Verlust der optischen Vorstellungen kann die Ausführung solcher Bewegungen bei geschlossenen Augen so gut wie unmöglich machen. Verf. meint, dass die Störung die Folge einer Beeinträchtigung in der Bildung des "Hintergrundes" ist, gegen den diese Bewegungen ausgeführt werden. Die gewohnten Bewegungen des täglichen Lebens sind weit weniger gestört. Kinesthetische und kinetische Hilfsvorgänge können allenthalben die Störung in erheblichem Maass ausgleichen. TH. ZIEHEN (Halle a/S.).

757. KURELLA, H. V., Ueber die Roggesche Theorie der Wortumbildung und ihre Bedeutung für die Psychologie. *Monats. f. Psychiat. u. Neurol.*, 1923, **54**, 337–340.

Kurzer Hinweis auf die bemerkenswerte vitalistische Theorie Rogge's (vgl. z. B. *Zeits. f. vergleich. Sprachforschung*, 1923) und die Beziehung zu einzelnen psychologischen Richtungen. TH. ZIEHEN (Halle a/S.).

758. Kollarits, J., Die Probleme des Charakters, des Trieblebens, der Vitalität, Horme und die Heredodegenerationskonzeption Jendrassiks in der Psychiatrie. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, **72**, 21–39.

Verf. ein Schüler Jendrassiks, tritt mit grosser Wärme für die Anschauungen seines Lehrers ein. Insbesondere betont er dass J. seine Heredodegeneration auch in die Psychiatrie einführte und unter den "Heredoanomalien" auch Heredo*amelioration*en neben den Heredo*degenerationen* unterschied. Verf. selbst hat dann, hiervon ausgehend, die Zurückführung auf verschiedene *Charakterarten* versucht und will jetzt den Charakter prinzipiell auf jene "biologischen Kräfte" zurückführen, "die hinter dem Charakter liegen," und "die man organische Strebungen, Triebe vitale Kräfte oder nach v. Monakow Horme nennenkann." Jendrassik hatte von "mangelhafter Lebenskraft" in einzelnen Bahnen bei Heredodegenerationen gesprochen, Verf. bezieht dies auf eine potentielle Energie im lebenden Protoplasma, die Monakow's Horme auch insofern entspricht, als nach Monakow die Horme auch einzelnen Organteilen anzunehmen ist. Wenn schon auf *motorischen* Gebiet die Aufstellung besonderer Typen der Heredoanomalien sehr kompliziert ist, so gilt dies erst recht für das psychische Gebiet, sodass wir auf unendliche Varietäten der Charakterarten rechnen müssen. Die Charakterologie kann nur die Haupttypen herausgreifen. Verf. selbst unterscheidet zwei Grundformen: die lebenslustbetonten oder aufbauenden und die lebensunlustbetonten oder abbauenden Charakterarten. Th. Ziehen (Halle a/S.).

759. Scripture, E. W., Das Stottern. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, **72**, 108–113.

Kurze Darstellung der der Hauptsymptome, der Pathologie und Therapie. Th. Ziehen (Halle a/S.).

760. Möllenhoff, F., Zur Frage des Zusammenhangs zwischen Körperbau und Psychose. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, **71**, 98–127.

Verf. liefert einen bemerkenswerten Beitrag zur Frage, ob gesetzmässige Korrelationen zwischen bestimmten körperlichen Merkmalen ("Körperbau") und geistigen Eigenschaften bestehen. Er hat speziell 189 schizophrene Patienten der Leipziger Klinik (125 Männer, 64 Frauen) im Hinblick auf diese Frage untersucht und "nichts gefunden, was für eine Affinität der klinischen Bilder zu einer

bestimmten körperlichen Erscheinung spräche." Besonders beachtenswert ist das für die körperlichen Merkmale nach Vorberatungen mit Prof. Martin entworfene Untersuchungsblatt (S. 107 ff.). Auch ist zu erwähnen, dass sich überhaupt nur eine beschränkte Zahl der untersuchten Personen in einen bestimmten Typus (astenisch, athletisch, pyknisch, dysplastisch) bezüglich des Körperbaues einreihen liess. TH. ZIEHEN (Halle a/S.).

761. HELLWIG, A., Zur Kritik der Experimente der Fernbewegung Schrenck-Notzings. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, 71, 610–620.

Kurzer kritischer Bericht über das Buch von Schrenck-Notzing, *Experimente der Fernbewegung,* 1924. H. stellt fest, dass die darin niedergelegten Beobachtungen nicht ausreichen, um in zuverlässiger Weise das Vorkommen sogenannter "Fernbewegungen" oder von "Verkörperungen" zu beweisen. TH. ZIEHEN (Halle a/S.).

762. MICHEL, R., und WEEBER, R., Körperbau und Charakter. *Arch. f. Psychiat. u. Nervenkrankheiten,* 1924, 71, 265–271.

Im Gegensatz zu anderen Autoren glauben die Verff. auf Grund ihrer Untersuchungen an Geisteskranken (Material viel zu klein) die Kretschmerschen Behauptungen bestätigen zu können. So sollen z. B. asthenische, asthenisch-athletische sowie dysplastische Körperbautypen "nahezu ausschliesslich bei Schizophrenie vorgefunden werden." TH. ZIEHEN (Halle a/S.).

763. BONHOEFFER, K., Zur Klinik und Lokalisation des Agrammatismus und der Rechts-Links-Desorientierung. *Monats. f. Psychiat. u. Neurol.,* 1923, **54**, 11–42.

Verf. berichtet ausführlich über die agrammatischen Symptome in einem Fall, der zugleich—unabhängig von einer Störung des Wortverständnisses—eine auffällige Unfähigkeit zeigte, rechts und links zu unterscheiden, während die sogenannte Praxie im Wesentlichen ungestört war. Befehle, die ein rechts und links enthalten, wurden oft falsch ausgeführt. Sollte der Kranke sein rechtes Auge zeigen, zeigte er sein linkes. Sollte er die Stellung irgend eines Objekts zu seinem eigenen Körper angeben, so verwechselte er vorn und hinten, oben und unten nur anfangs gelegentlich, dagegen rechts und links monatelang in ausgesprochener Weise. Die Sektion ergab im Wesentlichen nur Zustörungen in der mittleren Partie der linken hinteren Zentralwindung, im linken Gyrus supramarginalis, im inneren Teil

der linken Heschlschen Windung und in einem kleinen Bezirk der der letzteren anliegenden medialen Lippe der unteren Schläfenwindung; Stirnhirn, Insel, Operculum und Brocasches Zentrum waren intakt. Es scheint somit nachgewiesen, dass Agrammatismus durch Läsionen des Temporallappens zu Stande kommen kann. Verf. hält aber auf Grund andered Fälle fest, dass wahrscheinlich auch Läsionen der motorischen Sprachregion Agrammatismus bedingen können. Die Störung der Rechts-Linksauffassung führt er auf die starke Lageempfindungs- und Taststörung der rechten Hand zurück (Herd in der hinteren Zentralwindung) bezw. die Unterbrechung der Assoziation zwischen linker Tastsphäre und den optisch-motorischen Gebieten des Occipitalhirns (starke Degeneration im unteren Längsbündel). TH. ZIEHEN (Halle a/S.).

764. SIMONS, A., Ueber den Verlust der Zeilenführung. *Monats. f. Psychiat. u. Neurol.*, 1923, **54**, 321–336.

Pick hat 1921 über einen Fall uraemischer Psychose mit transitorischen Herderscheinungen (rechtsseitiger Hemianopsi und Hemiparese) berichtet, in dem die horizontale Linienführung bei dem Schreiben schwer gestört war. Verf. teilt einen auch für die Normalpsychologie sehr interessanten analogen Fall mit, der einen Kunstmaler betraf (Granatsplitterverletzung in der linken Schläfengegend) und versucht die eigenartige "Treppenschrift" und die "Fächerform" der Briefe zu erklären. Er lehnt mit Recht eine Zurückführung der Störung auf den Bogengangapparat (Pick) ab. Durch eigene Versuche an *normalen* Personen hat er festgestellt, dass kalorische Labyrinthreizung trotz Nystagmus, Vorbeizeigen und Fallneigung keinerlei Störungen des Schreibens, insbesondere auch keine Störung der Linienführung bedingt (auch bei geschlossenen Augen nicht). Er will daher den Verlust der Zeilen führung auf starke Ablenkung der Aufmerksamkeit (infolge der begleitenden Hirnsymptome: Merkdefekt und sensorische Aphasie) zurückführen. Interessante Kontroluntersuchungen an normalen 7-11 jährigen rechtshändigen Kindern ergaben folgendes: Fast alle Kinder dieses Alters schreiben bei geschlossenen Augen langsamer and *viel stärker aufsteigend* als mit offenen. Innere Ablenkung durch Rechnen usf. war ohne Einfluss hierauf. Bei weniger schreibgeübten Kindern kommt auch terassenförmige Verstellung von Buchstaben und Silben vor, die bei Ablenkung deutlich zunimmt und derjenigen bei dem hirnkranken Kunstmaler sehr ähnelt. Verf. weist ausserdem darauf hin, dass die überwiegende normale Neigung zur Aufwarts-

richtung der Zeile wohl damit zusammenhängt, dass die " Innervation nach oben und aussen " bevorzugt ist, und hat festgestellt, dass in der Ermüdung und bei traumhafter Niederschrift diese Neigung auch bei Menschen wiederkehrt, die sonst streng die horizontale Linie einhalten. Th. Ziehen (Halle a/S.).

765. Schuster, J., Zur Pathoarchitektonik der Dementia praecox. *J. f. Psychol. u. Neurol.*, 1924, **31**, 1.

Diese Arbeit stellt den ersten Versuch dar, eine genaue pathoarchitektonische Hirnkarte der Dementia praecox aufzustellen. Es liegt ihr eine Beobachtung zugrunde, in deren Vordergrund Gehörshalluzinationen standen. Die belangreichsten pathologischen Veränderungen (Degenerationserscheinungen, Blähungen der Ganglienzellen mit Blähung des Zelleibes, des Kernes) fanden sich nun gerade in den Hörzentren: den Schläfenwindungen. Und zwar war die dritte Schicht der Gyri temporales am schwersten ergriffen. Es fanden sich ausserdem die histologischen Anfänge derselben Veränderungen stellenweise in der Veränderung der vierten Schicht der Gyri frontales 1 und 2. Ob diese Veränderungen der Zellen in den Temporalwindungen zu den beobachteten klinischen Symptomen in kausaler Beziehung stehen, kann von dem vorsichtigen Verfasser nicht entschieden werden. Trotzdem er ähnliche Befunde in 4 anderen klinisch der mitgeteilten Erkrankungsform entsprechenden Fällen feststellen konnte. W. Riese (Frankfurt a/M.).

766. Riese, W., Beiträge zur Faseranatomie der Stammganglien. *J. f. Psychol. u. Neurol.*, 1924, **31**, 81.

Die von Wilson unter dem Namen der " lenticular degeneration " beschiebene, mit eigenartigen Bewegungsstörungen einhergehende Erkrankung der Stammganglien, sowie die Erfahrungen, die man an den, von ähnlichen Erscheinungen begleiteten Nachkrankheiten der Encephalitis epidemica in den letzten Jahren zu machen Gelegenheit hatte, veranlassten den Verfasser zu seinem Versuch, die namentlich von C. und O. Vogt gefördete Kenntnis über den Bau der Stammganglien zu erweitern. Er bedient sich dabei aller in Frage kommender hirnanatomischen Methoden: der vergleichendanatomischen (zumal an wasserlebenden Säugern, Walen), der pathologisch-anatomischen (an Hirnen mit ausschliesslichen Rindendefekten und intakten Stammganglien, sowie an Hirnen mit ausschliesslichen Stammgangliendefekten und intakter Rinde), der myelogenetischen (an unreifen, menschlichen Früchten verschiedenen Alters), endlich

der tierexperimentellen (an Hunde und Katzengehirnen, dennen experimentelle Läsionen verschiedener Localisation gesetzt wurden). Van den Ergebnissen dürften hier wohl interessieren: die Tatsache, dass es eine direkte Faserbeziehung zwischen dem Stammganglien und der im Mittelhirn gelegenen Substantia nigra gibt, ferner, dass eine direkte Rindenverbindung zum Striatum (dem phylogenetisch jüngeren Anteil der Stammganglien) sich nicht, wohl aber eine solche direkte Rindenverbindung zum Pallidum (dem phylogenetisch älteren Anteil der Stammganglien) nachweisen lässt. W. Riese (Frankfurt a/M.).

767. Kogerer, Worttaubheit, Melodientaubheit, Gebärdenagnosie. *Zeits. f. d. ges. Neurol. u. Psychol.*, **92**, 483–496.

Mitteilung eines Falles von luetischer Hirnerkrankung, bei dem im Anschluss an apoplektiforme Anfälle die drei im Titel genannten Störungen auftraten, während der sensorische Anteil und die innere Sprache völlig ungestört waren. Besonders die sehr selten beobachtete Gebärdenagnosie, die sich jedesmal nach einiger Zeit zurückbildete, verdient Interesse, da Kranke mit diesem Ausfall bisher nur ganz wenige beschrieben sind. Trotzdem die Patienten auch die einfachsten Gebärden nicht erkannte, war sie sowohl fähig spontan richtige Gesten zu machen, als auch vorgemachte zu beschrieben und zu imitieren, ohne sie zu verstehen. Die Rückbildung dieser Störung ging weder der Besserung der Worttaubheit, noch der Melodientaubheit parallel. Die niederen Ausdrucksbewegungen (nach *Wundt*) kehrten früher als die höheren (pantomimischen) zurück. Über die Lokalisation der Störung lässt sich aus dem vorliegenden Falle ebensowenig Sicheres entnehmen wie aus der Kasuistik der Literatur. W. Mayer-Gross (Heidelberg).

768. Grünthal, Über das Symptom der Einstellungsstörung bei exogenen Psychosen. *Zeits. f. d. ges. Neurol. u. Psychol.*, **92**, 255–266.

Der Autor hat in einer früheren Arbeit im Anschluss an *Pick* nachgewiesen, dass die Merksstörung bei dem Korsakowschen Symptomenkomplex zum Teil als "Einstellungsstörung" aufzufassen ist; d.h. vorgetäuscht wird durch die Unfähigkeit oder Erschwerung im Denkablauf "aus einem einmal angeschlagenen Gedankenkreis herauszukommen," "Beziehungen mit ausserhalb dieses Kreises gelegenen Vorstellungen einzuschalten." Diese Störung findet sich nach dem hier beigebrachten Material auch im deliranten und amenten

Zustandsbildern, weshalb Gr. sie für ein charakteristisches Symptom bei exogenen Psychosen hält. Auch das Auftreten der Konfabulationen glaubt er aus der Einstellungsstörung erklaren zu können. W. Mayer-Gross (Heidelberg).

769. Hartmann und Schilder, Zur Klinik und Psychologie der Amentia (mit besonderer Berücksichtigung der Grippepsychosen. *Zeits. f. d. ges. Neurol. u. Psychol.*, **92**, 531–596.

Die sorgfältig durchgeführte psychologische Analyse einiger Fälle von postinfektiösen Psychosen, welche das Zustandsbild der Amentia zeigen, kommt zu bemerkenswerten Ergebnissen dadurch, dass die Verfasser die Störungen des psychischen Ablaufs in diesen Verwirrtheitszuständen den entsprechenden Anomalien bei akuten schizophrenen Psychosen gegenüberstellen. Im Vordergrund steht die eigentümliche " Zerrissenheit," die sich sowohl auf die Auffassung der Aussenwelt, als auch auf die reichhaltigen, vorwiegend optischen Halluzinationen, und schliesslich auch auf den Denkablauf erstreckt. Diese zerrissenen Gebilde werden nicht einmal wie im Traume oder in der Schizophrenie durch Triebregungen und Triebhaltungen zusammengefasst. Die Persönlichkeit, das Ich protestiert gegen die verworrenen Erlebnisse, steht ihnen *ratlos* gegenüber. Dementsprechend sind die motorischen Reaktionen weder von der Geschlossenheit schizophrener Handlungen, die aus den schizophrenen Denkergebnissen folgen, noch entsprechen sie den katatonen " Handlungsresten," die bei der Schizophrenie mitunter beobachtet werden. So wird die Amentia als eine " Ich-ferne " Störung der psychischen Apparate aufgefasst, gegen die sich die Persönlichkeit wehrt, die immer versucht, das frühere Ich, die gesunde Persönlichkeit und die reale Aussenwelt festzuhalten. Im zweiten klinischen Teil werden Katamnesen von 56 postgrippösen Psychosen mitgeteilt. W. Mayer-Gross (Heidelberg).

770. Mikulski und Herman, Die Hirnpulsation des Menschen auf Grund experimenteller Untersuchungen. *Zeits. f. d. ges. Neurol. u. Psychol.*, **90**, 469–520.

Die Arbeit bringt eine eingehende Übersicht über die einschlägige Literatur. Experimentell wurden bei einem Fall mit Schädeldefekt festgehalten: (1) Zeitkurve, (2) Cephalogramm, (3) Myogramm, (4) Pneumogramm nach 2 Methoden und der Einfluss verschiedener Faktoren auf die Hirnpulsation geprüft. Sowohl die Einwirkung psychischer Einflüsse als physiologische Reize wurden untersucht.

Einzelheiten und Resultate müssen nachgelesen werden, da nicht zu kurzem Referat geeignet. H. Bürger (Heidelberg).

771. Taterka, Partielle Apraxie des rechten Armes nach linksseitiger Hemiplegie bei einer Linkshänderin. *Zeits. f. d. ges. Neurol. u. Psychol.*, **90**, 573–579.

Mitteilung eines Falles von apoplektischer Hemiplegie (pyramidaler Typus) mit linksseitiger Lähmung und rechtsarmigen apraktischen Störungen, verbunden mit leichter sensorischer Aphasie bei einer ausgesprochenen Linkshänderin. Die Autopsie ergab: Rechts Thalamus und Kapsel stark zerstört durch einen Erweichungsherd, von dem ein Ausläufer den Balken in Linsengrösse destruierte, im fronto-occipitalen Durchmesser in etwas über 1 cm. Länge. Ausserdem ein stecknadelkopfgrosser Herd in der rechten Pedunkulusgegend, der klinisch bedeutungslos blieb. Sensible und motorische Ausfallserscheinungen sind durch die Thalamus- und Kapselschädigung geklärt. Die sensorische Aphasie bezieht Verfasser auf allgemeine mikroskopische Umänderungen und auf die Läsion der Bastian'schen Balkenbahn (Fasern, die beide Schläfenlappen funktionell in gewisse Verbindung setzen). Die rechtsarmige Apraxie hält Verfasser für durch den Balkenherd bedingt und nimmt an, dass zu dem für die Entstehung apraktischer Symptome optimalen Sitz dieses Herds im mittleren Drittel des Balkens hinzukommt die Linkshändigkeit der Patientin—dass also an sich schon der rechte Arm der ungeschicktere war, und darum eine zentrale Schädigung nicht mehr so gross zu sein brauchte, um eine manifeste Apraxie zu erzeugen. H. Bürger (Heidelberg).

772. Stier, Über das gewohnheitsmässige nächtliche Kopfschütteln der Kinder. *Zeits. f. d. ges. Neurol. u. Psychol.*, **90**, 212–234.

Bericht über 15 Fälle aus seiner Praxis. Das Kopfschütteln bestand bei der Mehrzahl der Kinder in rhythmischen, pendelartigem Hin- und Herdrehen des Kopfes um seine Längsachse, oft unter Begleitung der Arme und des Oberkörpers, manchmal begleitet von ausgestossenen summenden Tönen. Entstanden bei 80 per centum im 1 Lebensjahr, war bis zum 6 die Erscheinung meist verschwunden. Beschränkt auf die Zeit des Einschlafens oder des tiefen Schlafes, dauerte das Schütteln ½ Stunde bis zur Ausdehnung über die ganze Nachtzeit. In den Familien, denen die kleinen Patienten entstammten, finden sich überdurchschnittlich viel nervöse Anomalien, neuropathische Konstitution mit Geistesschwäche. Die Kinder selbst

waren fast sämtlich körperlich schwächlich, charakterologisch aus dem Rahmen des Gewohnten fallend: reizbar, schwer erziehbar, unverträglich, schüchtern und alle motorisch übererregt. Neun Fälle zeigten deutlich verlangsamte geistige Entwicklung. Verfasser sieht in dem Symptom ein Einschläferungs-, Beruhigungs- und schlaferhaltendes Mittel, das, als Bewegung phylogenetisch alt, vorwiegend subkortikal geleitet wird. Als Therapie bevorzugt Verfasser die suggestive Behandlung. Die Prognose hängt davon ab, ob das Kopfschütteln als Ausdruck einer unterwertigen Konstitution anzusehen ist—wenigstens hinsichtlich der Gesamtentwicklung des Kindes. Im allgemeinen ist mit dem Verschwinden des Symptoms bis zur Pubertätszeit zu rechnen. H. Bürger (Heidelberg).

773. Fischer, B., Beitrag zur reaktiven Melancholie. *Zeits. f. d. ges. Neurol. u. Psychol.*, **88**, 226–233.

Verfasser rollt aufs Neue die Frage der Entstehungskoeffizienten der Phasen im Umkreis des manisch-depressiven Irreseins auf, ohne prinzipiell Stellung zu nehmen. Bei zwei Fällen, deren Inhalte sich während einer Depression wesentlich um massive Konflikte sexualethischer Natur drehen, sucht er die Verschiebung dieser Auslösungs- und Entstehungsbedingungen zur reaktiven Seite hin darzutun in dem Sinne " dass ein exogenes Moment deutlicher zu Tage tritt und als reaktive auslösende Ursache in Frage kommt." H. Bürger (Heidelberg).

774. Stockert, F. G., Zur Aetiologie der Mitbewegungen beim Stottern. *Zeits. f. d. ges. Neurol. u. Psychol.*, **88**, 459–467.

Verfasser geht von der Beobachtung aus, dass Mitbewegungen nur beim sog. tonischen Stottern sich finden, dagegen beim klonischen fehlen. Bei Versuchen stellte er fest, dass irgendeine den Versuchspersonen aufgetragene krafterfordernde Bewegung oder Haltung die benötigte Sprechzeit eines Wortes bei tonischem Stottern verkürzte, andrerseits bei einem nicht stotternden Knaben hierbei klonisches Stottern auftrat—jeweils durch die erfolgte Ablenkung der Aufmerksamkeit vom Sprechakt, worin Verfasser die Wurzel für die Herabsetzung des Tonus und die Steigerung des Klonus erblickt. Er fasst daher die schon von *Fröschel* als mehr oder minder zweckmässig aussgezeigten Mitbewegungen beim tonischen Stottern als Mittel auf, durch die der Stotternde seine Aufmerksamkeit vom Sprechakt selbst abzulenken versucht. H. Bürger (Heidelberg).

775. Schneider, K., Ueber die Notwendigkeit einer dreifachen Fragestellung bei der systematischen Erfassung von Psychosen. *Zeits. f. d. ges. Neurol. u. Psychol.*, **91**, 200–209.

Wegen der Vieldeutigkeit der psychiatrischen Symptome hält S. in der Psychiatrie die Stellung einer Diagnose nach Art der übrigen Medizin nicht für möglich, stellt vielmehr zur Erfassung der Psychose drei diagnostische Gesichtspunkte auf: (1) Ist eine Diagnose im Sinne der somatischen Medizin möglich? Dies trifft zu bei allen primären organischen Erkrankungen des Gehirns, welche in erster Linie aus körperlichen Symptomen diagnostiziert werden, ferner bei den Vergiftungen und Infektionen, bei Urämie und Kretinismus. Eine solche Diagnose manifester Gehirnkrankheiten ist das erstrebenswerte, weil therapeutisch bedeutungsvollste Ziel der Psychiatrie. (2) Welches ist der z. Z. der Untersuchung vorhandene *Zustandstypus* der Psychose? Die Psychiatrie kennt bisher eine ganze Anzahl solcher Typen, deren Abgrenzung verschwommen ist und einer psychologischen Bearbeitung und Verschärfung bedarf. (3) Welcher *Verlaufstypus* liegt vor? Reaktion, bezw. Entwicklung einer abnormen Persönlichkeit oder eine Psychose, welche entweder als eine heilende vorübergehende Phase oder ein irreparabler Prozess anzusehen ist. Beim letzteren können wiederum psychotische Dauerzustände ohne Weiterentwicklung oder eine kontinuierlich oder in Schüben sich vollziehende Entwicklung nach "Abbau" oder "Umbau" unterschieden werden. W. Mayer-Gross (Heidelberg).

776. Berze, Eigenartige Gesichtshalluzinationen in einem Falle von akuter Trinkerpsychose. *Zeits. f. d. ges. Neurol. u. Psychol.*, **84**, 487–521.

Die Arbeit geht von der Selbstschilderung eines Kranken aus, der eine Delirium tremens-artige, erlebnisreiche Psychose nach ihrem Abklingen ausführlich beschrieben hat. Neben zahlreichen anderen halluzinatorischen Phänomenen nahm der Pat. das von ihm so genannte "luminöse Fernschreiben" wahr. Er sah in einer Entfernung von 5–6 m. eine Schrift entstehen, die im Entstehen wieder verschwand, und war gezwungen, unter Anspannung grösster Aufmerksamkeit diese Schrift zu lesen. Die Schriftzüge waren die bekannter Personen, die abwechselnd ihm auf diese Weise Mitteilung machten. B. sucht der Natur dieses Phänomens näher zu kommen, indem er es mit dem "Gedankenlautwerden" (*Cramer*) vergleicht. Er erörtert die Rolle der Aufmerksamkeit, des Motorischen überhaupt für die Entstehung der Halluzinationen im allgemeinen und deutet das

"luminöse Fernschreiben" als ein optischkinästhetisches Halluzinieren. W. MAYER-GROSS (Heidelberg).

777. STORCH, Bewusstseinsebenen und Wirklichkeitsbereiche in der Schizophrenie. *Zeits. f. d. ges. Neurol. u. Psychol.*, 82, 321–341.

St. versucht die Gegebenheitsweise der realen Aussenwelt und der Welt der psychotischen Erlebnisse bei Schizophrenen näher zu kennzeichnen und voneinander phänomenologisch abzugrenzen. Das schizophrenie Erlebnis ist gekennzeichnet durch einen "seelischen Konkretismus"; anklingende Gedankkeime und Gefühlsregungen werden in Bewegungsformen und anschaulichen inneren Bildern manifest. Dies ist eine Eigentümlichkeit tieferer "Bewusstseinslagen" im Sinne *Bergsons*. Es kommt ferner zu einer Verwobenheit von Ich- und Gegenstandsqualitäten, wodurch die Dingwelt in einer neuen Daseinsweise erscheint. Daraus ergibt sich eine Daseinsabhängigkeit der Objektwelt vom Ich des Kranken, wodurch die Wirklichkeit des Krankhaften einen von der Realität abweichenden Charakter erhält. Grenzfälle der Ich-Welt-Durchdringung sind Weltverlust und Ichverlust, wie sie von einzelnen Patienten beschrieben werden. W. MAYER-GROSS (Heidelberg).

778. MAIER, W. H., Über einige Arten der psychogenen Mechanismen. *Zeits. f. d. ges. Neurol. u. Psychol.*, 82, 193–198.

Neben der früher von dem Autor herausgehobenen Katathymie (psychogene Wirkungen affektbetonter Vorstellungskomplexe) unterscheidet M. "athyme" psychogene Mechanismen, worunter er Relikte organischer Störungen versteht, die auf psychogenem Wage festgehalten werden. Dabei spielen Affekte keine Rolle. Drittens nennt er "synthyme" diejenigen psychogenen Entäufserungen, bei denen ein psychogen ausgelöster Affekt die ganze Persönlichkeit hemmungslos mitreisst z. B. psychogene Erregungszustände bei organischen Hirnkranken, wobei sich der Affekt völlig von der "Assoziationsreihe" loslöst. W. MAYER-GROSS (Heidelberg).

779. EWALD, Die biologischen Grundlagen von Temperament und Charakter und ihre Bedeutung für die Abgrenzung des manisch-melancholischen Irreseins. *Zeits. f. d. ges. Neurol. u. Psychol.*, 84, 384–407.

Im Anschluss an den Temperamentsbegriff *Jodls* und *Höffdings* bezeichnet E. als Temperament "den individuell gegebenen, flotten oder weniger flotten Stoffwechselumsatz mit dem daraus resultieren-

den Biotonus " und ordnet ihm das psychische Tempo und die Vitalgefühle zu. Demgegenüber ist ihm der Charakter " die individuell gegebene Funktionsbereitschaft (Triebleben und Reaktionsart) des Zentralnervensystems." Das manisch-melancholische Irresein in einem sehr weiten Sinne (einschliesslich periodische Halluzinosen, Paranoia, expansive Autopsychose) fasst er als Temperamentskrankheiten auf und belegt diese Hypothese mit mannigfalten Einzeltatsachen aus verschiedenen Psychologien und biologischen Gebieten. W. Mayer-Gross (Heidelberg).

780. Bychowski, Psychopathologische Untersuchungen über die Folgezustände nach der Encephalitis epidemica, insbesondere dem Parkinsonismus. *Zeits. f. d. ges. Neurol. u. Psychol.*, **83**, 201–246.

B. hat an Patienten mit den charakteristischen Motilitätsstörungen des Parkinsonismus Assoziations- und Reaktionsversuche angestellt, plethysmographische Kurven aufgenommen und die Arbeitskurve mit dem Kraepelinschen Additionsversuch festgestellt. Die objektiven Ergebnisse sind wenig belangvoll, bestätigen nur das bereits klinisch Festgestellte. Interessant werden sie erst durch die Angaben der Patienten über ihre Motilitätserschwerung, die aber noch wenig einheitlich und kaum auf eine einleuchtende Formel zu bringen sind. B. versucht die nachgewiesenen Ausfälle auch sofort auf bestimmte Hirnteile zu beziehen und ergeht sich in theoretischen Erörterungen, die sich allzusehr ins allgemeine verlieren. Er glaubt durch seine Befunde sowohl die James-Langesche Gefühlstheorie, wie auch die Theorie der Schizophrenie von Berze widerlegen zu können. W. Mayer-Gross (Heidelberg).

781. Maeder, Psychopathologie und allgemeine Pathologie. *Zeits. f. d. ges. Neurol. u. Psychol.*, **82**, 176–192.

Der Verf. tritt für die Ausdehnung psychopathologischer Betrachtungsweise auf körperlich Kranke ein und weist in grundsätzlichen Ausführungen daraufhin, wie sehr der Ablauf somatischer Störungen von der seelischen Stellungnahme des Kranken zu seiner Krankheit abhänge. Sowohl die " Wirkung des Zerstörerischen," wie die Abwehr des Organismus und die Wiederherstellung und Heilung sind weitgehend von der seelischen Seite her beeinflussbar. In theoretischen Erörterungen verfolgt M. die Wege, auf denen diese Beeinflussung vor sich gehen könne. W. Mayer-Gross (Heidelberg).

782. v. Kuenberg, Über das Erfassen einfacher Beziehungen an anschaulichem Material bei Hirngeschädigten, insbesondere bei Aphasischen. Ein Beitrag zum Abstraktionsproblem. *Zeits. f. d. ges. Neurol. u. Psychol.*, **85**, 120–163.

Das Ergebnis der interessanten Arbeit, welche die erstmals auf Külpes Anregung von Grünbaum durchgeführten Abstraktionsversuche mit Hilfe kleiner, sinnloser Figuren an Hirnverletzten des Münchener Instituts anwandte, lässt sich kurz folgendermassen zusammenfassen: es zeigte sich in erster Linie, dass Aphasische bei diesen Versuchen, bei denen eine sprachliche Hilfe völlig entbehrt werden kann, sich durchaus wie Normale verhalten. Ihre Denkleistungen erwiesen sich—entgegen der Ansicht mancher französischer Autoren—als völlig ungeschädigt, so "schwachsinnig" sie auch infolge der Sprachbehinderung erscheinen mögen. Dagegen waren die Leistungen bei optisch geschädigten Hirnverletzten dem optischen Defekt entsprechend minderwertig. Desgleichen leisteten die infolge des Hirnschusses in der Gesamtintelligenz Geschädigten wenig, aber immerhin noch besseres als angeboren Schwachsinnige, die zum Vergleich herangezogen wurden. Verf. warnt davor, mit der Diagnose Demenz bei Aphasischen voreilig zu sein. W. Mayer-Gross (Heidelberg).

783. Travis, L. E., A Test for Distinguishing Between Schizophrenoses and Psychoneuroses. *J. Abnorm. Psychol., etc.*, 1924, **19**, 283–299.

The test described in this discussion is an attempt at an objective and empirical differential test between schizophrenoses and psychoneuroses to help in an early and accurate diagnosis upon which future treatment so largely depends. The fact that these two types of mental disorder are diametrically opposed, the former characterized by negativism and restriction of reactions and the latter by suggestibility and expansion of behavior, formed the basis of the supposition that the underlying mechanism must be antithetic and tests bringing this out might be valuable. Out of the cases tested by reaction time to auditory and electrical stimuli during crystal gazing and compared with a threshold of pre-crystal gazing and post-crystal gazing, all the psychoneurotics experienced a lowering of thresholds during crystal gazing, and all the dementia precox cases except three (in which, however, diagnoses were doubtful) experienced a raising of the threshold. Although the reaction times were not of sufficient uniformity to warrant conclusions, the two groups so clinically dia-

metrically opposed reacted so consistently in the lowering and raising of the threshold that it was reasonably felt that a differential test had been found. The alteration of the liminal value during crystal gazing was thought to be due to a central set or attitude and not to any peripheral factors such as changes in the receptor. E. F. SYMMES (Boston Psychopathic Hospital).

10. INDIVIDUAL, RACIAL AND SOCIAL PSYCHOLOGY

784. KRONFELD, A., Zur Phaenomenologie und theoretischen Psychologie der individuellen Kultur. *Monats. f. Psychol. u. Neurol.*, 1923, **54**, 245–266.

Theoretische Konstruktionen über die *intentionalen* Beziehungen (im Sinne Husserls), Unterscheidung einer "intrajektiven" und einer "projektiven" Phase des "gefühlshaften inneren Gerichtetseins" und entsprechender Dispositionen: zur Erlebnisfülle, zur Differenziertheit der Erlebnisformen, zur schöpferischen Synthese und Problematisationsfähigkeit. TH. ZIEHEN (Halle a/S.).

785. STERN-PIPER, Zur Frage der Bedeutung der psychophysischen Typen Kretschmers. *Zeits. f. d. ges. Neurol. u. Psychol.*, **84**, 408–414.

Der Verf. weist auf die Beziehung der Kretschmerschen Körperbautypen zu den europäischen Rassen hin und auf die Fehlerquellen, die sich aus Verwandtschaft des pyknischen Typus zur alpinen und des asthenischen zur nordischen Rasse in die Folgerungen Kretschmers eingeschlichen haben. Viele der Eigenschaften, die K. so besonders kennzeichnend erscheinen, sind Rassenmerkmale. W. MAYER-GROSS (Heidelberg).

786. HÖPLER, E., Wirtschaftslage-Bildung-Kriminalität. *Arch. f. Krim.*, 1924, **76**, 81–109.

787. HEINDL, R., Wirtschaftslage-Bildung-Kriminalität. Einige ergänzende Zahlen zum vorhergehenden Artikel. *Arch. f. Krim.*, 1924, **76**, 110–114.

Höpler begründet durch kritische Verwertung zahlreicher kriminal-statistischer Angaben, besonders durch Vergleiche der Vorkriegs-, Kriegs- und Nachkriegs-Kriminalität Erwachsener und Jugendlicher den Satz: "Die wirtschaftliche Not bildet zweifellos einen gefährlichen Anreiz zum Verbrechen; dagegen muss in wahrer Bildung

eines der wichtigsten Gegengifte gegen den verbrecherischen Anreiz erblickt werden." Heindl fügt Mitteilungen aus der schwedischen Kriminalstatistik hinzu, die den Zusammenhang zwischen Kriminalität einerseits, Krieg, Wirtschaftslage, Witterungsbedingungen andrerseits erkennen lassen. O. Lipmann (Berlin).

788. Schütz, O., Psychologische Tatbestandaufnahmen an Untersuchungsgefangenen. *Arch. f. Krim.*, 1924, **76**, 150–151.

Schütz konnte bei Untersuchungsgefangenen Benussis Theorie über das "Atmungssymptom der Lüge" nicht bestätigen. Bei Haft-Neurotikern zeigten sich hysterische Abwehrreaktionen, welche die Durchführung des Benussi'schen Versuches unmöglich machten. Ueberhaupt ist der Versuch bei psychisch nicht völlig intakten Persönlichkeiten, also bei der Mehrzahl von Untersuchungsgefangenen, nicht verwendbar. Schütz glaubt, die Methode Benussis geradezu dazu verwenden zu können, die Psychopathen unter den Untersuchungsgefangenen zu erkennen. O. Lipmann (Berlin).

789. Thurnwald, R., Zum gegenwärtigen Stande der Völkerpsychologie. *Kölner Vierteljahrshefte f. Soziol.*, 1924, **4**.

Thurnwald gibt einen kurzen historischen Ueberblick über die Entwicklung der Völkerpsychologie bei Lazarus, Steinthal, Wundt, Felix Krüger, usw. Ohne eine Kritik über die Stellung der Soziologie zur Völkerpsychologie zu fällen, trennt Verfasser doch beide Gebiete, die auf verschiedenen Ebenen liegen. Die Psychologische Betrachtung des Völkerlebens verlangt die Herausarbeitung zweier Gesichtspunkte: (1) Die Sonderbetrachtung der verschiedenen Völkerindividualitäten, also die differentielle Völkerpsychologie, (2) die Zusammenfassung der im Völkerleben allgemein wiederkehrenden psychischen Vorgänge, das Allgemeine des Gruppenlebens, wie es durch seelische und geistige Vorgänge im Staat, Familie, Wirtschaftsverbänden, usw., sich abspielt. Daneben unterschiedet Verfasser eine allgemeine Völkerpsychologie, die das allgemeine Leben der Völker in seinen Grundzügen umfasst. Bei der Analyse der Kollektivphänomene muss man letzten Endes immer auf die interindividuellen Verhaltungsweisen und deren seelische Mechanismen zurückgreifen. Daneben kommen aber noch die Parallelreaktionen inbetracht, denen Gruppen etwa durch gleiches Klima, ähnlich Schicksale, gleiche Institutionen ausgesetzt sind. Aus dem Ineinanderwirken der interindividuellen Beziehungen und der Parallelreaktionen kristallisieren sich jene Wiederholungsvorgänge, die uns als Gewohnheit,

Sitte oder Einrichtung, als Niederschlag aus der psychisch-historischen Konstellation entgegentritt. P. PLAUT (Berlin).

790. HEYNSBERGEN, v., Ueber den sittlichen Fortschritt der Menschheit. *Arch. f. Krim.*, 1924, **76**, 203–212.

Bericht über einen Vortrag von Bonger "Over de Evolutie der Moraliteit." van Heynsbergen kritisiert an Bongers Ausführungen Folgendes: Auch die Moralität der Wohlhabenden ist ein Teilfaktor der Gesamtmoralität und auch ein kausaler Faktor für die Entwicklung der Gesamtmoralität. Die Besserung der Kriminalität kann nicht nur durch Besserung der gesellschaftlichen Verhältnisse sondern auch durch sittliche Hebung des Individuums erreicht werden. Die beste Quelle, aus der die Kraft zum sittlichen Wachstum wächst, ist die Religion. O. LIPMANN (Berlin).

791. GERSON, A., Ueber den Selbstmord. *Arch. f. Krim.*, 1924, **76**, 47–53; 213–220.

Gerson berichtet zunächst über Selbstmorde, Selbstverstümmlungen und Morde von Artgenossen bei Tieren und zeigt, dass die tierischen Selbstmorde bedingt sind entweder durch eine Herabsetzung des Schmerzgefühls oder durch ein Versagen der auf die Sicherung des eigenen Körpers gerichteten Instinkte. Beim Menschen ist das Schmerzgefühl keine ausreichende Sicherung gegen den Selbstmord; dafür tritt hier die Angst vor dem Unbekannten. Der Selbsterhaltungstrieb wird beim Menschen noch gestärkt und gestützt durch das Selbstbewusstsein. Ausser durch Versagen der Angst vor dem Unbekannten oder des Selbstbewusstseins kann auch beim Menschen wie beim Tiere das Versagen der auf die Erhaltung des eigenen Körpers gerichteten Instinkte zum Selbstmord führen. Letzten Endes steht beim Menschen wie beim Tier der Selbstmord im Dienste der Auslese, und er kommt zustande auf Grund eines der Rassenveredlung dienenden Instinktes. Keineswegs darf angenommen werden, dass der Selbstmörder im Augenblicke des Selbstmordes unzurechnungsfähog sei. O. LIPMANN (Berlin).

11. MENTAL DEVELOPMENT IN MAN

792. CRONER, E., Die Psyche der weiblichen Jugend. *Päd. Mag.*, 1924, **996**, 63.

Die Verfasserin gibt eine beschreibende Darstellung von fünf Haupttypen des jungen Mädchens: der mütterliche, erotische, ro-

mántische, nüchterne, intellektuelle Typ, und behandelt das Individualitätsproblem, indem sie einerseits kennzeichnet die Stellungsnahme des weiblichen Jugenlichen gegenüber den grossen Menschheitsfragen: Religion, Freundschaft, Liebe, Kunst, und andrerseits das junge Mädchen charakterisiert als soziologisches Wesen (Haus und Familie, Schule, Beruf, Staat). In den beigegebenen Bildungs- und Entwickelungsgesetzen erklärt die Verfasserin den geistigen Stillstand, der bei den meisten jungen Mädchen mit etwa 20 Jahren eintritt und von den wenigsten überwunden wird, als seelischen Hemmungszustand, der möglicherweise organische Parallelerscheinungen aufweist. Die geistige Elite, diejenigen nämlich, die diese "zweite Pubertätszeit" überwinden, gelangt dadurch erst zu produktivem Schaffen. Daher kommt es, dass Schriftstellerinnen allgemein in späteren Jahren ihre ersten Bücher schreiben als Schriftsteller. Durch die vorliegende Arbeit erfährt die Psychologie der Jugendlichen keine nennenswerte Bereicherung. A. Haas.

793. Rausch, A., Der praktische Wert der pädagogischen Wissenschaft. *Päd. Mag.*, 1924, **976**, 21.

Die Eröffnungsvorlesung zu einem in Königsberg i. Pr. abgehaltenen pädagogischen Zirkel ist besonders empfehlenswert für diejenigen, die noch immer nicht recht an die Pädagogik als Wissenschaft glauben wollen. An der Hand gediegener Belesenheit und der reichen Erfahrung eines langen schulischen Lebens wird die Aufgabe in ihrer Bedeutung für die Gesellschaft, den Staat, die Jugend und den Lehrer klar und wohlgeordnet beleuchtet. F. W. Schroeder (Königsberg).

794. Sallwürk, E. v., Die Wege der Erkenntnis. Intellektualismus und Intuitionalismus. *Päd. Mag.*, 1924, **1001**, 38.

Die Frage der Intuition und ihre wissenschaftliche Fundierung harrt noch der Bearbeitung. Nach der historischen Seite bietet S. in seinem unermüdlichen Fleisse und in seiner zuverlässigen Belesenheit von Platon bis auf Bergson, Spengler und die intuitionalistischen Richtungen der Gegenwart bemerkenswerte Fingerzeige. Der Wert der beiden Erscheinungen für die Wissenschaft wie für die allgemeine Bildung erfährt eine gerechte Würdigung. Hervorgehoben wird, wie wenig bestimmt der Begriff der Intuition überall gefasst ist. Eine bewährte Methode des Intuitionalismus gibt es auch trotz marktschreierischer Anpreisungen der "Neusten" nicht. F. W. Schroeder (Königsberg).

795. Rein, W., Zur gegenwärtigen Lage der Lehrerbildung. *Päd. Mag.*, 1924, **992**, 30.

Jeder psychologisch Interessierte wird die Entwicklung der Lehrerbildungsfrage mit Aufmerksamkeit verfolgen. Aus der Hand des Nestors, der viele Jahrzennte in der Bewegung gestanden, erhält man hier ein gestreues Bild von der gegenwärtigen Lage und ein verständiges Abwägen des Für und Wider. Dass in der Oberlehrerprüfung die Pädagogik als allgemein verbindliches Fach fehlt, ist zu unterstreichen. Wenn Thüringen und Sachsen der Hochschule die Aufgabe der Lehrerbildung zuweisen, Bayern und Preussen die Gründung "Padagogischer Akademien oder Institute" ins Auge fassen, so wird der Wettbewerb, der naturgemäss zwischen diesen verschiedenen Organisationen sich einstellt, beide anspornen, das Höchste zu leisten. Uniformität ist in geistigen Dingen kein Ideal. (S. 26 f.) F. W. Schroeder (Königsberg).

796. Sallwürk, E. v., Der Rhythmus des Geisteslebens. *Pad. Mag.*, 1924, **986**, 26.

Ein inhaltsreicher und doch leicht verständlicher Beitrag zur Psychologie des Geisteslebens! Unter besonderer Betonung der Polarität von Kollektivismus und Individualismus erfahren die Hauptepochen vom römischen Imperium ab bis zu den anthroposophischen Bestrebungen der Gegenwart und dem "Abbau der kollektivistischen Errungenschaften der Revolution" angemessene Blickeinstellung und geistvolle Durchleuchtung. Nach S. bestimmt das Individuum den Rhythmus des Geschehens. Die Frage der inneren psychischen Notwendigkeit, der Abfolge, der philosophische Ausblick auf ihre Gesetzmässigkeit ist leider erst zum Schluss nur gestreift worden. F. W. Schroeder (Königsberg).

797. Kramer, F., Die Willenskrankheiten und ihre pädagogische Therapie. *Päd. Mag.*, 1924, **1003**, 28.

Die Skizze bewegt sich, ohne mit der reichen Literatur der letzten Jahre Fühlung zu haben, nur an der Oberfläche des vielseitigen und in der Gegenwart gewiss besonders wichtigen Themas. F. W. Schroeder (Königsberg).

798. Wagner, J., Pädagogische Wertlehre. Untersuchungen und Betrachtungen zur Lehre vom pädagogischen Wert als Grundlage der Kulturpädagogik. *Päd. Mono.*, 1924, **23**, 177.

Wenn die Lehre vom Pädagogischen vom kulturpädagogischen Standpunkt aus betrachtet werden soll, so wird dadurch zum Aus-

druck gebracht, dass das pädagogische Verhalten ein kulturelles Tun im weitesten Sinne ist. Kultur und Erziehung sind von einander abhängige Funktionen. So behandelt Verfasser neben dieser allgemeinen Grundkorrelation im besonderen die Beziehungen zwischen: Wertbegriff und Kulturpädagogik, Werttheorie und Teleologie der Erziehung, pädagogischem Naturalismus und Wertbegriff. In weiterren kurzen Abschnitten wird behandelt: System der pädagogischen Wissenschaft und der Wertgedanke. Zur Geschichte der Wertlehre in ihrer Beziehung zur Pädagogik. Der Wertbegriff und Folgerungen für eine Theorie des pädagogischen Wertes. Der pädagogische Wert und das Problem der Gültigkeit. (Das Problem der Allgemeingültigkeit pädagogischer Werte, Geltungsgedanke und Individualität.) Der pädagogische Wert als Bedürfniswert. Kulturgut und Bildungsgut in werttheoretischer Beleuchtung. Der Bildungsprozess im Lichte der pädagogischen Wertlehre. Die pädagogische Bedeutung der Wertgebiete: der religiöse, ethische, ästhetische, logische, praktische, hedonische Wert, das Verhältnis der Wertklassen im System der pädagogischen Werte als Grundlage des pädagogischen Ideals. Wertbewusstsein und pädagogisches Denken der Gegenwart und die Analyse des pädagogischen Denkens und der moderne pädagogische Wertgedanke. Im Schlusskapitel wird schliesslich die Persönlichkeit und Totalität der Welt der Werte, die Wertgrundlagen der Schulorganisationen und die Beziehung zwischen Kultur und Staatspädagogik behandelt. P. Plaut (Berlin).

799. Argelander, A., Arbeitsschule und Lernleistung. *Zeits. f. päd. Psychol.*, 1924, **25**, 193–208.

Kinder aus Schulklassen mit vorwiegend rezeptiver Vermittlung des Bildungsstoffes werden in Bezug auf Gedächtnisqualitäten auf experimentellem Wege mit Kindern verglichen, deren Unterrichtsform auf freitätigen Bildungserwerb eingestellt ist. Ergebnis: (1) Die Methode der Lernschule bringt eine stärkere Uebung des Gedächtnisses für sprachliches Material mit sich, auch wenn dieses in seinem Sinnzusammenhange nicht voll erfasst ist; (2) Das Arbeitsprinzip erzieht die Schüler zum sorgfältigen Beobachten und selbständigen Verarbeiten anschaulich gegebener Dinge. Die Wiedergabe sprachlichen Materials wird mehr sinngemäss als wortgetreu gefördert. H. Bogen (Berlin).

800. Bogen, H., Ueber Beobachtbarkeit verschiedener Eigenschaften in der Schule. *Allgemeine Deutsche Lehrerzeitung,* 1924, **35**, 513–515.

Die Ergebnisse beziehen sich auf eine Statistik an mehr als 2,000 psychologischen Auskunftkarten für Berufsantwärter, wie sie die Gross-Berliner Schulen den Berufsanwärtern vor der Berufswahl zugehen lassen. Die Beobachtungsmöglichkeit seelischer Aeusserungen in der Schule erweist sich abhängig von der Stärke der unterrichtlichen Beanspruchung einer Funktion und von ihrem psychologischen Aufbau. In ihrem Aufbau stark willensmässig bestimmte Verhaltensweisen werden relativ gut beobachtet. In erster Linie das Gesamtbild der Individualität bestimmende intellektuelle Anlagen werden mit mittlerer Häufigkeit beobachtet. Am seltensten werden solche Anlagen beobachtet, die eine stärkere Gerichtetheit auf die Gestaltung und das Erleben des Arbeitsprozesses aufweisen. Das weibliche Geschlecht scheint der Beobachtung durch den Lehrer in der Pubertätszeit grössere Wiederstände entgegenzusetzen. H. Bogen (Berlin).

801. Giering, K., Jugendpsychologisches bei Gottfried Keller. *Allgemeine Deutsche Lehrerzeitung,* 1924, **35**, 748–750.

Es werden Kinder- und jugendpsychologisch wertvolle Einzelheiten aus Kellers selbstbiographischen Schriften gesammelt und mitgeteilt. Sie beziehen sich auf die Entwicklung des Gottesbewusstseins im Kinde, die Struktur der Phantasielüge im Reifealter und das Erwachen des erotischen Erlebens. H. Bogen (Berlin).

802. Richert, H., Psychologie und Pädagogik der Entwicklungsjahre. *Zur Fortbildung des Lehrers,* 1924, **42**, 40.

Aus der Praxis geschöpft ist die Kenntnis der jugendlichen Seele, aus dem Willen zum Guten fliesst das Verständnis ihrer Nöte und ihrer Mölichkeiten, aus Wahrhaftigkeit und Verantwortung entspringt das Bekenntnis zur verpflichtenden Achtung der Würde des Menschen im Jugendlichen. A. Haas.

803. Post, E., Beruf und Seele. *Deutsche Lehrerbücherei,* 1924, **5**, 37.

Die vorliegende Abhandlung stellt sich in den Dienst der Berufsversittlichung. Die Feststellung der beruflichen Eigenarten, der persönlichen Berufseignung im individuellen wie im Gemeinschaftsinteresse, wie der Beziehungen von Seele und Beruf, werden erkannt

als Aufgabe der Berufsseelenkunde. Eine Aenderung der Berufsgesinnung, "Berufene" machen, kann kein Mensch, keine Einrichtung, also auch nicht die Berufsseelenkunde, wie der Verfasser meint. Wenn es einen allgemeinen gangbaren Weg gäbe zur "Verinnerlichung der Persönlichkeit," dann wäre allerdings die Berufsauffassung anders, die Klassenfrage erledigt, das Gemeinschaftsgefühl geboren, dann regierte das Recht, wo heute Willkür und Machtgier herrschen. Die Berufsseelenkunde aber bedeutet auf dem Wege zu diesem Ziel nur einen kleinen Schritt. A. Haas.

804. Essig, O., Beruf und Menschentum. *Die Lebensschule,* 1924, **5**, 98.

Gemeinsam mit einigen ihrer Gesinnungsgenossen gibt Olga Essig ihre Gedanken bekannt zur Berufsschulfrage, die sich nicht erschöpfen in einer Kritik der bestehenden, auf Heranbildung von kapitalistisch möglichst nützlichen Arbeitsmaschinen bedachten Volks- und Berufsschulen. Die Ausführungen kennzeichnen als Ziel die Führung des Einzelnen, entsprechend seiner individuellen Veranlagung, Begabung und Eignung, zu dem Punkte, an dem er selbst im Stande ist, den ihm gemässen "Beruf" innerhalb der Gemeinschaft zu wählen und freudig und arbeitswertbewusst auszuüben. Zur Erreichung dieses Zieles geben Verf. Mittel und Wege an: diese bestehen im wesentlichen in der Verknüpfung von Schule und Leben zum Zwecke der Berufskenntnis und Eignungserkenntnis, in der Erweckung und Pflege der Berufsgesinnung durch Vermittlung der Prinzipien und Zusammenhänge der Wissenschaften von Wirtschaft, Gesellschaft, Staat und Recht. Folgte die Praxis der Theorie, so wäre nicht länger der Beruf, sondern die Leistung im "Beruf" Wertmesser des Menschen. A. Haas.

12. MENTAL EVOLUTION

805. Greene, C. W., Notes on the Olfactory and Other Physiological Reactions of the California Hagfish. *Science,* 1925, **61**, 68–70.

The blind California hagfish, *Polistotrema stouti,* shows a great sensitiveness both to physical contact and to chemical stimuli. A reaction may be evoked in the resting fish either by a slight touch upon the tentacles or the skin of the head, or by the introduction of bit of food (dead fish) into the aquarium. In the latter case, the

hagfish swims along the train through the water taken by the bait and seems to search for it, apparently guided by chemical sense. G. J. Rich (Chicago, Ill.).

806. Renqvist, Y., Über die photoelektrische Reaktion des Froschauges. *Skand. Arch. f. Physiol.*, 1924, **45**, 95–131.

Der Netzhautaktionsstrom kann als ein Ausdruck des zeitlichen Ablaufs der Erregung in der Netzhaut aufgefasst werden. Unter diesem Gesichtspunkt wird der Einfluss von superponierten Belichtungen in zahlreichen Versuchen mit einer sehr vollkommenen Versuchmethodik untersucht: es zeigt sich deutlich ein verschiedener Ablauf dieser photoelektrischen Phänomene je nach der Farbe des zur Reizung dienenden Lichtes. O. Klemm (Leipzig).

807. Wölfflin, E., Der Augenhintergrund des Löwen. *Zeits. f. d. ges. Anat.*, 1923, **69**, 1–4.

Die ophthalmoskopische Untersuchung eines abessinischen Löwen ergab: keine Fovea und auch kein Foveareflex. Das Tapetum des Augenhintergrundes findet sich vornehmlich in den oberen Teilen der Netzhaut, die vom direkten Sonnenlicht nicht getroffen werden, und ist sicherlich bei dem besonders guten Dämmerungssehen des Löwen beteiligt. O. Klemm (Leipzig).

808. Berger, K., Experimentelle Studien über Schallperzeption bei Reptilien. *Zeits. f. vgl. Physiol.*, 1924, **1**, 517–540.

Drei verschiedene Methoden wurden angewandt: (1) Weckversuche (Öffnen der Augen auf Schallreize hin), (2) Dressurversuche (Füttern beim Erklingen eines bestimmten Tones), (3) Versuche über den Einfluss von Tönen auf den Reflexmechanismus der Atmung (Verstärkung der Kehloszillationen, usw.). Das Ergebnis war in allen drei Versuchsgruppen positiv. Die Frage, ob die Schallreaktionen als Gehörsreaktionen aufzufassen sind, blieb offen. F. Pauli (Leipzig).

809. Franz, V., Die Sinnesfunktion des Gehirnbläschens des Lanzettfisches (*Branchiostoma lanceolatum* (Pall.)). *Biol. Zentralbl.*, 1924, **44**, 9–15.

Das Gehirnbläschen wird als Schattensinnesorgan gedeutet in dem Sinn, dass der frontal gelegene Pigmentfleck als Schattenwerfer und das von Boeke entdeckte Infundibularsinnesorgan als Rezep-

tionsorgan fungiert. Durch Zerstörung des Gehirnbläschens wird die negative Phototaxis beeinträchtigt. F. Pauli (Leipzig).

810. Matthes, E., Das Geruchsvermögen von Triton beim Aufenthalt unter Wasser. *Zeits. f. vgl. Physiol.*, 1924, 1, 57–83.

Verf. definiert den Geruchssinn als "denjenigen Teil des chemischen Sinnes, der seine Empfangsorgane in der Schleimhaut der Nasenhöhle und den Nervus olfactorius zur afferenten Bahn hat." Der Begriff "Witterungsvermögen" wird im weiteren Sinne gebraucht.—Auschaltung des optischen Sinnes blieb ohne Einfluss auf die Witterungsreaktion. Ausschaltung des chemischen Sinnes durch temporären Nasenverschluss oder Durchtrennung der N. olfactorii hatte Ausbleiben der Witterungsreaktion zur Folge. Auch bei Nasenverschluss unter gleichzeitigem Einschalten eines künstlichen Atemkanales, durch den das Atemwasser in die Mundhöhle gelangte, unterblieb die Witterungsreaktion, während bewegte Beute erfasst wurde. Der Nachweis des Geruchsvermögens (nach obiger Definition) ist somit erbracht. F. Pauli (Leipzig).

811. Matthes, E., Die Rolle des Gesichts-, Geruchs- und Erschütterungssinnes für den Nahrungserwerb bei Triton. *Biol. Zentralbl.*, 1924, **44**, 72–87.

Fortsetzung der Arbeit über den Geruchssinn des Triton (*Zeits. f. vgl. Physiol.*, 1924). Erschütterungssinn, Gesicht und Geruch genügen jeder für sich allein zum "Alarmieren" wie auch zum Finden. Wirkliches Erkennen der Beute erfolgt nur durch den Geruch. Praktisch ist der Gesichtssinn am wichtigsten. Er versagt bei bewegungsloser Beute. F. Pauli (Leipzig).

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THE
PSYCHOLOGICAL BULLETIN

THE PSYCHOLOGICAL BASES OF SOCIAL SCIENCE

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I. The Social Behavior of the Individual: Social Psychology

Within the last few years the entrance of psychologists into the socio-psychological field has tipped the scales of interest toward the psychological side. Though still important to sociologists, social psychology is now regarded by many as a branch distinctly of psychology, dealing with the responses of the individual to the social part of his environment and describing the social consciousness of the individual.

Thus Hunter (**50**) regards "interstimulation and response" as the fundamental fact to be studied. Broadening the field to include the social behavior of animals, he rejects Ellwood's limitation of the social category to "consciously interacting" groups. Hunter recognizes that behavior often serves not only as response, but as stimulus, to other individuals. Gault (**37**) similarly defines social psychology as a study of "interactions among animals" and, more specifically, of reactions of human beings to one another. His illustrations refer to responses of individuals *in the presence of* others, rather than exclusively *to* one another. Such situations are classified by Allport (1) as responses to "contributory social stimulation," which underlie the influence of the social surroundings in the "co-acting group" and the crowd. They are distinguishable from the "direct" social stimulations which occur in conversation, discussion, conflict, and all face-to-face groups. Allport also includes the behavior comprised in the "making of social stimulations" (language, expression,

gesture) as a portion of the field. Dunlap (27), though developing a slightly different emphasis, gives both formulation and respect to the viewpoint stated above; while Smith and Guthrie (94) employ a double definition embracing the "individual's response to his fellow men" and "concerted behavior" within groups.

Sociological writers are approaching the same definition. Bogardus (17) designates the field as one of "intersocial stimulalation and response." He throws the emphasis upon the development of personalities and social attitudes out of interstimulation. In the latter and more interesting portion of his book he parts company with the casual and psychological viewpoint, and discusses group aspects and leadership descriptively and sociologically. The reviewer would regard Bogardus' attempt to ascribe causal significance to *the group* (as in the "interaction between group and individual" or "between one group and another") as a failure of analysis. Individuals stimulate and respond, but groups do not (except as individuals). Williams (103) defines social psychology as "the science of the motives of people living in social relations," and develops his definition through a survey of the rivalries of economic and social conflict. The discussion is practical, but it seldom penetrates to the psychological foundations. Keeping close to the concrete interactions of individuals, his work falls within the scope of the definition of social psychology which we have been tracing. Bogardus and Williams are telic and ethical in their outlook, rather than explanatory.

Social psychology therefore has become fairly identified with situations in which *individuals stimulate and respond to one another*, a formulation which, for convenience, we may call the "social behavior viewpoint." Although in many ways an advantage, this somewhat precise definition narrows the field to data in which the psychologist, preëminently, is interested. Many human responses, for example, reactions to tools, soil, and climate are psychological facts as important to the *sociologist* as reactions to other human beings. The "group" standpoint also remains as the legitimate center of sociological interest. Hence Ellwood (29) prefers a study of *the psychic factors involved in* the "origin, development, structure, and functioning of social groups." The expression of this view becomes somewhat metaphorical when Ellwood (30) speaks of "a web of intercommunication" (language) along which are transmitted "mental patterns" from individual to individual, thus permitting the group-wide dissemination of "ideals," "values," and culture in

general. The social behavior viewpoint would reduce the transmission of these mental patterns, which are described as if floating at large in society, to terms of stimulus and response between individuals.

II. The Pluralistic Approach: "Societal Psychology"

The more definite delimitation of the field of social psychology has thus left out of account a number of problems for whose classification a new socio-psychological science seems to be indicated. These problems may best be summarized under Professor Giddings' viewpoint of "pluralistic behavior". The basic fact here is not interaction (social behavior) but a plurality of separate and similarly acting individuals. Giddings (38) begins, on the subjective side, with a plurality of like-minded individuals, each conscious of his similarity to the others. Objectively the situation is a "plurum" of similarly reacting units. Stimulations from the others, being closely like stimulations received from one's self in the same activities, develop on the one hand a consciousness of kind, and upon the other, a reinforcement of one's behavior through the like responses of others. We tend to respond more readily to reactions which are like our own. The phenomenon agrees closely with that which, under the name of "social facilitation", Allport (1, Ch. 11) has recognized as basic in the co-acting group. Giddings' principle, however, is deeper than the social behavior setting, and prior to it; for he assumes a plurum of reacting units similar in constitution and therefore in response before any interaction has taken place. Two important conditions influence the extent and pattern of the plural response. They are (1) the range (number of individuals reached by the stimulus), and (2) the "reaction area" of the collective response as determined by imperativeness of the stimulus, degree of homogeniety, and similar factors (39).[1] The Willeys (102) attempt to explain the consciousness of kind as due to a conditioning stimulus (common element, *i.e.*, "kind") which evokes the reaction attaching to the original situation in which kind was experienced. Humphrey (49) has made a similar use of the conditioned response to explain that resistance to the unfamiliar in conduct upon which adherence to custom is based.

[1] Further developments of the "pluralistic behavior" concept, together with suggestions for a measuring technique, are to be found in Professor Giddings' *The Scientific Study of Human Society*, University of North Carolina Press. This important work appeared too late to be included in this review.

The pluralistic approach as developed by Kantor rests upon uniform (or institutionalized) responses to stimulating objects (*e.g.*, weather, culture objects, and personages) common to the group. He rejects both instincts and physiological psychology as false or irrelevant viewpoints (54, 55, 56). Natural biological similarities are recognized; but the *acquired* or *cultural* reactions learned in the social environment (tradition) and common to the group he regards as the true field for scientific social psychology (54, 56, 58). This theory, which throws valuable light on the nature of institutions, belongs rather to the pluralistic than to the interactional field of socio-psychological science. Only genetically, that is, in the individual's learning of cultural reactions, is social behavior involved. Smith and Guthrie (94) also list a number of situations which call forth common, or "concerted", responses. These "coenotropes" are the basis of tradition, morality, and institutions. A similar conception in terms of social attitudes (approval, etc.) is suggested by Reuter (85).

Summary. The two psychological approaches described in sections I and II may be summarized and differentiated as follows. The second position will be stated first.

A. There is, first, the mass of similar responses of the members of a group or society to the common objects (other than persons) of their environment. These like responses, innate or acquired, are the very stuff of tradition, custom, institutions and organized social living. The science dealing with them is fundamental, relatively simple, and constitutes a psychological restatement, in behavior terms, of all the social sciences. Using the term, and in part the conception, of Giddings (39), we may call it *societal psychology.*

B. Secondly, there arises upon the simple pluralistic basis phenomena of a secondary and complex nature. These are the responses of individuals *to one another,* that is, the making of *social* stimulations and the responding to them. Facts belonging to this class comprise the field of *social psychology.*

Since both sciences are psychological, both deal only with *individuals* as units of explanation. Group aspects are used merely to depict and delimit the mass phenomena to be explained. There is no "psychology of society" as contrasted with the psychology of the individual. Societal psychology deals with individuals as discrete units of pluralistic aggregates; social psychology deals with individuals as stimulating and responding to one another. In spite of

the obvious overlapping and interweaving of these two fields, the distinction seems to be both warranted by the literature, and useful.

III. Psychology and Social Causation

A few dying echoes of the social mind metaphor are still to be heard. With the "collective racial unconscious" of the Jung school we may class Rivers' elaboration of social conflict upon the analogy of mental conflict in the individual (87). Bodenhafer (16) argues that every sort of datum studied really begins as an aggregate of units. Opponents of the group mind have been aggressive. M. Ginsberg (40) finds the "group mind" and "general will" to be concepts quite incompatible with psychological notions of mind and will. Perry's amusing analysis (79) deflates collective mind to verbalism and abstraction of inconsequentials. Laird (62) and Hubert (48) have given further penetrating analyses. Allport has assailed Rivers' pathological metaphor, and has urged against the practice of prefixing the term "social" to psychological terms (*e.g.*, "social habits"), a usage likely to prove a veiled form of the group mind fallacy (4). Sociologists have objected to Allport's contention, in the same paper, that such concepts as "the group" and "the super-organic order" are valid only for descriptive, *not for explanatory,* purposes. Every science, he says, draws its causal principles from the science just beneath it in the hierarchy of complexity of data. The social sciences, therefore, may *depict* phenomena in group and culture terms, but they must *explain* them through the individual, that is, by the aid of psychology. Sacred sociological soil is here invaded.

IV. Special Problems of Social Psychology

Instinct versus Social Determination. Many sociologists, welcoming support for their social determinism, have joined forces with the critical movement, current in psychology, against the theory of instincts. McDougall has striven doughtily against his critics, and has renewed his appeal to sociologists (71, 72). There have been a few recent books on social topics written from the standpoint of instincts. The most important are those by Groves (44, 45), Bartlett (11), and Eldridge (28). Miller (75) has argued for the existence of a powerful "group instinct". A number of writers, however, use the term "instinct" with guarded reservations or apologies. The following are among the social psychologists who

have rejected specific and complex instincts: Dewey (26), Bogardus (17), Gault (37), (retains indifferentiated "instinct"), Josey (52), Kantor (57), Williams (103), (substitutes "dispositions"), Dunlap (27), (substitutes physiologically grounded "desires"), Allport (1), (criticizes in particular the maturation theory), and Bernard (12). The "gregarious instinct" has been especially attacked by Cason (23), and Suttie (95); and the "maternal instinct" by R. Reed (83). Balz and Pott (8) emphasize the obscuring of instinctive elements by later modification in relation to habit, intelligence, and special capacities. Bernard, in his monumental work (12), catalogues inconsistencies and obscurities in the use of the concept, and considers that so-called "instincts" are really habits built up through the play of the social environment upon innumerable, nonspecific, reflex tendencies which are present at birth. He further analyzes systematically the formative influences present in the environment throughout life (13). Having in his book bustled instincts unceremoniously out of the house, Bernard, in a subsequent discussion (14), slams the door on them.

Dewey's position (26) may be instructively compared with that of McDougall in his *Introduction to Social Psychology*. The latter asserts an elaborate innate basis of behavior as an explanation of societal facts. Instincts are definite, specific, and socially oriented. Dewey, on the other hand, maintains that, although simple and random instinctive activities may have existed at birth, they have been overlaid by learning through social agencies to an unrecognizable extent. Society rather than instinct is responsible for the nature, conduct, and morality of mankind. Social psychology in this sense is fundamental to all psychology. In criticism, it may be said that Dewey's view, in its extreme, involves the "group fallacy". "Society" does not teach the individual anything, but only other individuals who are members of the "society". Balz and Pott (8) make the same error of considering the elementary social situation, a group of two, as the primary causal fact. Secondly, it is possible to overdo the theory of social determination. Few indeed of the critics of instinct have given fair recognition to McDougall for his insistence that there *is* something directive and formulative (though it need not be interpreted as purpose) behind the learning process. There is a determining tendency or drive which directs habit acquisition along useful lines (protection, sex, etc.), rather than toward haphazard patterns. This is the truly inherited factor; it may be mechanistically explained, but it can not be denied.

The reviewer (1, Ch. 3) has conceived this innate factor to be a relatively small number of reflexes, present in infancy, which are prepotent (*i.e.*, control the final common path) over other reflexes. Upon this basis he has worked out, through conditioning and learning, a substitute for the doctrine of instincts. McDougall and Dewey seem to him, therefore, to be both partially right, though neither exclusively. There *is* an innate dynamic factor (prepotent responses) directing the social life of the individual; and at the same time other individuals, as "vehicles" of tradition and culture, help to modify these responses, through social stimulation (language, etc.), into socially accepted patterns of behavior. The individual makes society; society (other individuals) makes the individual.

Personality, Social Attitudes, Adjustments. Much of the modern treatment in this important field is derived from psychoanalysis. All the recent textbooks have given attention to the social adjustments of personality. The family environment is studied by Groves (45), and Allport (1). Klüver (60) finds difficulty in connecting sociological types (*e.g.*, criminal) with proposed psychological categories. G. W. Allport applies the *Gestaltlehre* (6) in a demonstration that a personality must be socially "intuited" as a *whole*, whose meaning is lost upon analysis into traits or profiles. Burgess (19) and Bogardus (17) show the importance of social factors in determining the trend of personal development. Through their definition of "the person" as an "individual with status" they attempt (unjustifiably, the reviewer thinks) to lift the main problem of personality over into sociology. Social-self attitudes derived through identification with the mother are discussed by Burrow (20), while Willey and Herskovitz (100) find identification to be important in the relation of employer and employee. Ream's results (81) indicate that people prefer as working mates individuals with an activity level similar to their own.

Social and Religious Problems. Ames (7) has developed a definition of religion as the highest social consciousness within the group. Suggestion and other social behavior phenomena have been found by Shepherd (90) to be regularly employed in revival services. In addition to further crowd studies (70) Martin has given us a stimulating work showing the presence of neurotic manifestations and regressional attitudes toward the father throughout religious practices and symbols (67). Mecklin's account of the Ku Klux Klan (73) reveals such psychological factors as fear, love of ritual, and compensation for mediocrity. Intelligence levels in the general

population and in the flux of immigration have received attention from Brigham (18) and Gault (37). Willis (104) finds first-born children to be slightly less intelligent than second-born. Psychological problems of rural communities are considered by Groves (44), while Friedman (34) suggests reasons for the nervousness of the Jew.

Experiment in Social Psychology. Using groups for experimentation Whittemore (99) found differing effects of competition upon quantity and quality of work. Gates (36) discovered very slight effects upon performance due to being watched at work. Marked influences upon attention to lectures were found by Griffith to result from the social stimulations received from surrounding members of the audience (43).

V. Psychology in Relation to History and Political Science

The work of psychoanalytic interpretation of historical leaders and movements has been profitably continued by Hartman (47), Barnes (10), and O'Higgins (78). Kallen (53) argues significantly that since political science studies political behavior, it is really a form of psychology. Merriam (74) and Gosnell (42) have pointed out vital relations between psychological measurement and political procedure. Governmental process and the concepts of sovereignty, rights, liberty, and progress have been lucidly analyzed by Barnes (9). Psychological weakness of representation and detachment of executives and legislators from their constituents have been dealt with by M. Ginsberg (40) and Weeks (98). Garth (35) bases successful democracy upon freedom for learning by trial and error. The crowd-like speciousness of public opinion and political control is the theme of Martin (68, 69); while Lippman's challenge (64) portrays the "stereotyping" of popular beliefs through habit and conditioned emotional response. Willey and Rice (101) have measured the influence of a speech by W. J. Bryan upon the religious and scientific convictions of Dartmouth students. Eldridge (28) bases the hope of progress upon the ability of the sponsors of enlightened control to get possession of the popular suggestion process and other forms of the "technique of democracy."

Social and political attitudes (radicalism, conservatism, etc.) are vividly treated in current writing. The intricate mazes of inferiority conflict, projection, anger, rationalization, biased reasoning, hypocrisy, and distortions of scientific attitude are discussed by Wolfe

(106, 107, 108), Rice (86), E. F. Reed (82), Reid (84), Ogburn (77), Taylor (96), Allport (1), B. Ginzburg (41), Pruette (80), and Schmalhausen (88, 89). Very important contributions have been made to problems of leadership and group conflict adjustment by Follett (32) and Lindeman (63). Suppression and compromise are both rejected, and the possibility of an "integrated" solution involving, by finer analysis, the real needs of *all* claimants is concretely illustrated. Miss Follett applies her "participation theory" suggestively to existing political practice. Recent Freudian contributions to the origin of leadership and the State are worthy of notice. Contributors to this field are Freud (33), Rivers (87), Kelsen (59), and Kolnai (61). A discussion of these tendencies is also given by Allport (5). Symbolization of the father by the leader, "libidinal fixation" resembling hypnotic suggestion between leader and followers, sublimation of thwarted sexual impulses into bonds of group affiliation, and regression to infantile utopian ideas are among the principal themes.

VI. Psychology in Relation to Sociology and Anthropology

The culture problem has come to the fore through Ogburn's brilliant discussion of social change (76). Though recognizing psychology, this author states his laws of culture-dynamics (rate of change, accumulation, inertia, lag, etc.) from an inductive survey at the cultural level itself. Allport's criticism (2) alleges that this treatment is too much limited to description, explanation being possible only by considering the human individual (biological and psychological) as the unit of social change. The rôle of the individual has also been stressed, in respect to leadership, racial traits, capacity, and biological aspects, by Blackmar (15), Hankins (46), Chapin (24), and Huxley (51). But the strongest support has come from the anthropologist himself. Wissler (105) significantly asserts that culture is founded upon human behavior, which may be both innate and acquired. Although culture transmission may account for the *content* of the culture pattern (acquired behavior) in any people, it can not explain the *form* of that pattern, a form which is peculiar to mankind and universal among all races. Wissler's effort to link up the various complexes of the universal pattern with instinctive categories, though tentative, is nevertheless ingenious. Allport offers an explanation of the cultural trait-complexes through the universal operation of the prepotent responses (2, 4, 1).

Case (21) ascribes war to a combined instinctive and cultural causation. Culture patterns have been given a "mentalistic" or "psychic" reference by Wallis (97) and Ellwood (30). A further discussion of the culture concept containing some socio-psychological definitions has been given by Case (22).

Folkways and customs characteristic of a group have been termed by Bartlett "group difference tendencies" (11). He considers them as the adequate bases for the popular acceptance of folk-tales and similar culture elements. Allport (3) maintains that this view overlooks the psychological (*i.e.*, individual) factors upon which the continuance of folkways itself depends. Faris (31) turns the tables again by showing how much the psychologist himself might learn from ethnology. Notwithstanding the over-petulant invectives of G. E. Smith (91, 92), Malinowski, a first-hand observer, has shown that, with some revision as to the nature of the "nuclear complex", Freud was essentially right in his interpretation of conflict and repression as forces underlying and explaining primitive social organization (65, 66). Though fraught with disputes and misunderstandings, the *liaison* between psychology and anthropology seems interesting and full of promise.

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CRIMINOLOGY

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(On leave with the National Research Council)

Recent years have brought a skeptical attitude toward an earlier disposition to label criminals and juvenile delinquents with a single descriptive term. The common sense view that the individual and all the factors that play upon him through heredity and through his immediate surroundings are so vastly complex that no simple description is adequate, has apparently come into its own. In criminologic relations we are hearing less of "testers" and of a "mental test" and more of a diagnosis. There is more testing of tests than formerly. There are evidences that it is no longer in the best of taste to test or even to make a broad diagnosis of a group of delinquents or of criminals, and to let it go at that. Good form in scientific methodology calls out for a searching comparison, once a test or diagnosis of a delinquent group has been made, with a group of non-delinquents selected from a social and economic level that approximates to the corresponding level of the delinquent group. In this respect the development of scientific method here corresponds to that in other quarters.

"Mary, aged 15, has a mental age of nine years," is so absurdly simple a statement that it means nothing, probably even to the expert, excepting that there are certain types of things that Mary cannot do. A study of Mary's "quality" is required on top of the determination of her mental age as a preliminary to understanding what *positively* to do for her or with her (**116**). The determination of intelligence levels is a useful procedure (**44**) but its greatest value is negative. "No superstructure of useful adjustments can be built upon it" (**54, 56**).

The division of labor between the psychologist and the psychiatrist in the field of criminology has been a question for good natured dispute and no doubt it will continue to be so for some time to come. Perhaps no psychologist will recognize a clear boundary line but only areas in which he may bear down with greater emphasis and with less. Healy (**56**) believes that the psychologist has a right

to take a high place in relation to children because it is rare that out and out mental disease is found to be developed among them. Here the psychologist's special skill in arranging conditions for the development of habits and attitudes will stand him in especially good stead. But for this purpose we need the psychologist who is acquainted with the best in his own technical branch of science. The "get-rich-quick" variety does not belong here.

A study of nearly 1,000 prisoners in a New Jersey institution makes a comparison of these prisoners with 6,541 white draft recruits at Camp Dix, N. J. The distribution of letter grades makes this group identical with 1,500,000 recruits in the army as a whole.

The Army Alpha test was employed in examining the prisoners. Their practical illiteracy was found to be 3.6 per cent higher than in the army. The average score in the prison group is 15 points below that in the army as a whole. Seven per cent of the prisoners obtained scores equivalent to those of typical army officers (*i.e.*, above 105 points) while 13 per cent of recruits received such a score.

Disregarding the excessive proportion of negroes and low grade foreigners in the prison, the lowest 50 per cent of prisoners equals the lowest 40 per cent of recruits while the highest 10 per cent of prisoners do not exceed the highest 25 per cent of draft recruits. Altogether the intelligence of the prison population is somewhat below that of the recruits. But the army curve with which the comparison is made here represents a group containing no negroes (who grade lower than whites). But in the prison population 25 per cent are negroes and another 25 per cent are low grade foreigners. When allowance is made for selective influences on the basis of nationality and color the "mental constitution" of the prison corresponds very closely to the "average intelligence of adult males in the state as a whole" (30). The author of this study, Dr. Doll, with appropriate caution, disclaims that these results may be stated for prisoners everywhere. Selective influences are too widely divergent in different localities to allow such a claim.

Other studies in other localities may be said to substantiate these results. Dr. Stone, for example (111), believes that we have been subjecting our delinquents to more severe tests than the general population and that when correction is made at this point we can show no such disparity between the intelligence levels of the delinquent and the non-delinquent population as has been popularly believed to exist. Dr. Murchison (89) in an extended comparison of Alpha Army scores with those of delinquent groups makes it

appear more desirable to be a criminal than a non-criminal—if height of Alpha score may be taken as an index of desirability. For the criminal group, he finds, is superior to the white draft in the army, though less literate. Roving criminals are superior to stay-at-homes, and the reader is surprised to find the statement that recidivists are more intelligent than first offenders.

Women delinquents and non-delinquents compare quite as favorably as do corresponding groups among men according to Fernald, Hayes and Hawley (38). In an excellent example of detailed statistical work applied to social data they conclude that "even when we compare the delinquent group with the general population we find relatively slight distinctions and much overlapping."

Other comparisons of groups have been made within the period we are reviewing, notably by Vuillenmier between delinquents from city and country respectively (126). These studies point to no personal characteristics that distinguish one group from the other, but only to the fact that in the city crimes of violence to the person predominate over offenses against property, whereas the reverse is found for the country. This conclusion is likely open to question.

The results of comparing the intelligence levels of the delinquent and the normal groups being negative in character—or approximately so—investigators have naturally turned in other directions for a search after causes of criminality so far as may be found in the nature of the person, and to a new examination of our methods of research (97, 29). Personality traits other than intelligence, mental disease and social and economic factors also have come in for an enormous emphasis. Dr. Healy's showing of a practically normal distribution of intelligence among 1,212 juvenile delinquents in Boston (57) is a sufficient aggravation to lead away from intelligence levels of children, at any rate, in hunting the causes of criminality.

The diminished emphasis upon feebleness of mind as a cause of irregular conduct has been followed by an elaborate examination of emotional states (90). When the higher centers of control topple behavior becomes a riot. Consciousness is narrowed or lost temporarily and it is all blamed, in a last analysis, upon endocrinologic disturbances—which for all the evidence may be as much overworked as feeblemindedness has been in the past.

"Personality" and "character", once almost discarded terms, have again come to the fore, but in a new dress and with a new meaning (37). With these revivals the interview has been coming

into its own once more. But the investigator is at pains to make it a controlled interview.

A study of some of the personality types that have proved to be of unusual importance in criminologic study (the paranoid, the defective delinquent, and the psychopathic criminal), has led the Illinois State Criminologist to urge commitment to the guardianship of the state; not to an institution. The delinquent or criminal should be classed as a minor until he shall have proven his capacity to manage his own affairs (2).

The causal conditions of criminality as they are interpreted, that have been brought to light by "personality" studies are often of an insidious nature. Their seriousness is not easily recognized excepting by the initiated. Larson and Walker (74), from a background of practical police work, have discussed Paranoia and Paranoid Personalities and have shown that the chronic complainant—a character well known among police officials—belongs in this category. In the matter of treating such persons they go farther than many others would go at the present time and recommend that in hearings regarding lunacy a board of psychiatrists should sit as a substitute for a lay jury. But first of all the police must be so trained that they may recognize these characters when they find them. District attorneys and judiciary bodies also must be brought into a knowledge of such cases as a part of their professional training. The authors believe that all this will be of enormous practical value because it will greatly facilitate, not only finding these highly potential criminals but segregating them and thus affording the community the protection it justifiably expects.

Most chronic complainants may be suffering from some form of compulsion neurosis and the earlier they are recognized the better for all concerned. There are several descriptions in the literature of recent date of notorious instances of compulsion neuroses and their direful consequences. "The case of J. P. Watson, the Modern Bluebeard," reported by Hoag and Williams, is in point (62). This murderer of at least five wives was perhaps a victim of epilepsy and of sex perversion—judging from his elation after a killing. And Dr. Haines' account of a "Feebleminded Homicide" (49) is of the same order save that it is alleged of this thirty-seven-year old homicide that he is but five years and nine months old mentally. Considerable retardation! Curiously this character had so much appreciation of social situations that the jury considered him legally responsible for crime. No doubt it would be in accordance with the

vogue to-day to hypothesize emotional disturbances and compulsion neurosis in his case.

Spencer, Czolgoz and Richeson belong to the group of mentally unstable according to the view of Dr. Briggs (13). The compulsion neurosis is only one of manifold manifestations of instability and Dr. Briggs contends that the character of these creatures could have been recognized very early in their lives and that their instinctive forces might have been guided into a useful and happy way. To say so with respect to the three distinguished murderers mentioned above may be much of a pious wish; for psychiatry has probably made considerable strides since they flourished.

Descriptions of cases such as these are good advertisements of the psychiatric clinic, and the converse is true too, if the clinic can be said to be *advertising* the weakling by bringing him to light. But the clinic has in recent years got beyond the need of the exceptional case to exploit it. In prison, in courts and in the community without relation to such institutions, the clinic is performing a social service by discovering many who are unstable and by aiding other agencies such as the home and the school to fortify them (6).

A notable illustration of the clinic in action is found in the Recorder's Court in Detroit. A report on 1,988 offenders who had passed through the institution is illuminating (99). It shows a " high rate of psychiatric and phrenic deviation " and a " high incidence of recidivism ".

The ingenuity of the clinicians would have been strained to the utmost the day before the Franks murder in Chicago to discover Loeb and Leopold as the psychiatrists for the defense found them in the course of the trial. The chances are that the boys would have been overlooked in the succession of numerous cases. But while the trial was on we were told of the conflict between their " phantasy and their real life " of repression and of the " misplacement of their emotions " of their " abnormal urge toward activity of their disintegrated personalities " all leading to the conclusion that the murderers were " thoroughly unbalanced in their mental lives." At least this was asserted of Leopold. As to Loeb there was a " manifest split between his intellectual and emotional life ". He is of " pathological mind " (134). A " split " between individual or " clinical " psychology and social psychology is as prominent as a mountain in the contribution of the defense psychiatrists to this strange case. At least this is the view of many competent students. That the merest hypothesis received the emphasis of solid fact is all too evi-

dent. The psychiatrists for the prosecution did not find what the others discovered and the judge ignored both and took cognizance only of the youthfulness of the offenders" (35).

This called forth the pertinent remark from Dean Wigmore that the boundary between minority and legal age is only an arbitrary thing of convenience like a meridian and that it has as little relation to character as has an equator (35, 117). A brief symposium of comments upon the case by members of the legal profession is published in the *Journal of Criminal Law and Criminology*. With the possible exception of Judge Olson, who stresses emotional defect in the defendants, they recognize what appears to them the complete responsibility of the defendants. And Dean Wigmore trenchantly describes the language of the defense psychiatrists as that of Biology, "sheer determinism". If there is a noxious weed in the garden you cut it down. You do not spare it because it is its nature to be a weed. The measures of modern penal law are based on social self-defense; and penalties inflicted by the law do deter others, he urges, from committing offenses. Thus social self-defense is secured. In support of this view he cites the language of delinquent juveniles: "They can't hang us now because we aren't of age." "Let psychiatrists help criminals through the situation, by all means, but as advisers to the criminal court their determinism is out of place" (135). The morale of a community is the greatest bulwark of social self-defense and this morale is weakened by the doctrine of determinism in the criminal court because it runs toward mitigation of punishment (40). The "constructive way" of approaching a criminal trial and the specialization among judges (133) that some psychiatrists urge is a look away from the interest in the morale of the group toward the individual more narrowly considered. Here is the gap between social and individual psychology that ought to be bridged.

The plea of guilty in the Leopold-Loeb case followed by the introduction of psychiatric testimony by way of mitigation of punishment has led to an argument by S. S. Glueck to the effect that "if the law recognized degrees of responsibility and permitted the jury to accept evidence of mental disorder insufficient to prove complete irresponsibility as 'measured' by the 'tests' but sufficient to permit the jury to find a less degree of offense than would be the case when no such evidence was introduced, then resort to the plea of guilty and introduction of psychiatric testimony by way of mitigation would not be necessary" (42). If psychiatry touches man "in

his social integrations" (131) and if this is its genius it would appear that the psychiatrist would find therein a hindrance to stressing the form of deterministic view that aroused Wigmore's opposition.

Apropos of the prevalent attitude favorable to the mitigation of punishment, once mental defect has been demonstrated, it is noteworthy that Goddard, whose professional history might be supposed to bias him in that direction, has acknowledged the efficacy in "certain situations at any rate" of severe punishment once responsibility has been clearly demonstrated. This position he takes, presumably, on the ground that there is a reëducative value in such punishment (46), on the other hand Hollingworth (65) has little confidence in the effectiveness of reëducation in relation to the psychoneurotic.

Classification of the causes of crime are bound to be grossly inaccurate for the reason that "causes" are always exceedingly complicated (138). Dr. Healy is giving a splendid illustration of the fact in his "Studies from the Judge Baker Foundation" (55). Each case is described in a separate pamphlet at length; a protest against the apparent belief, now less to the fore than formerly, that a few signs can give an adequate perspective of delinquent behavior (27). This point has been emphasized by Professor Burt also in his report upon a study of 200 cases (15).

A classification for the use of institutions for the care of criminals and delinquents has been prepared by Dr. Pollock (96). The mental status he considers the most important guide to such a classification. The system suggested by the American Medico-Psychological Association for the Study of the Feebleminded in 1920 served as a guide in preparing the forms that Dr. Pollock published with this article.

Studies on the relations of narcotic drugs and crime have emphasized what had already been fully recognized by the medical and psychological profession, at least, that drug addiction is essentially a neuropsychiatric problem (130). At the same time it is a social problem. The drug clinic has apparently proven to be a failure as a mechanism for control (109). Dr. Santoz has made an admirable report on the subject to the Municipal Court in Boston (104). He writes from a psychological and a medico-legal standpoint and recommends a policy of severity on the part of the courts in dealing with criminals who are victims of addiction to narcotic drugs. This recommendation looks not so much toward a beneficiary effect upon the victim, as toward its social effect. The exercise of severity will draw public attention to the prevalence of addiction and through this avenue, he believes, it will bring relief.

A medico-legal case described by Dr. Tucker (119) illustrates the possibilities of surgical aid in certain types of cases. An external hydrocephalic victim of wanderlust, pyromania and kleptomania was improved by the expedient of draining the cerebrospinal fluid from within the dura out from under the temporal muscles where it was absorbed. The patient's insight into his past condition became excellent and his conduct is described as exemplary.

The general principles of medico-legal thought and work and the problems of risks, jeopardy and responsibility for carelessness are discussed at length by Zangger (139).

The management of a prison population is of perennial interest. The potential labor within the walls of penal institutions has for a long time directed attention to the possibility of administering them without creating a drain upon public funds (108). But the difficulties attendant upon the administration of labor *within* the walls are very great. This is especially true when the prisoners are women. Mrs. Hodder, Superintendent of the Reformatory for Women at Framingham, Mass., is attempting an experiment in the indenture of prisoners whose offenses range from drunkenness to manslaughter (63). Some of them are normal, others are psychopathic and still others are feebleminded. A daring experiment by a skilled experimenter!

In the department of police Chief Vollmer of Berkeley and his lieutenants are blazing the way of scientific work with unabated zeal. Research by men trained on the methods of science and of the development of adequate criminal statistics is the watchword of Vollmer (122). He sketches the evolution of the criminal record (125). He draws upon his wide experience and rare attainments for suggestions as to the classification of crimes and of criminals: a classification in which psychological factors loom large. His suggestions as to the proper contents of criminal statistics are particularly valuable now when the whole subject has been brought again to the fore by Professor Warner (127).

The selection of police officials has not gone unnoticed. An aptitude test for policemen seems to have been carefully devised and applied by Martin (84). A group of officers were rated on the basis of appearance, intelligence, discipline and efficiency. The ratings were made by four superior officers. Their correlation was 0.84. There was an analysis of the policeman's job. It is regulative, investigational and informational. On this basis certain mental traits were deemed to be essential in a successful officer, and eleven tests were employed that were deemed fit to reveal these traits.

Of somewhat different nature is Vollmer's adaptation of the Army tests to the selection of policemen and of supplementary tests to discover special aptitudes to guide the chief in placement within the department.

But perhaps the most interesting adventure in relation to the work of the police is Marston's development of deception tests by means of the systolic blood pressure (83). The average percentage of correct judgments by fourteen untrained observers who employed the test was high. Cases are described. The writer does not conclude, however, that the courts-martial or military intelligence officers should rely solely upon the results of the tests when they are operated by non-experts. But he believes they are absolutely reliable in the hands of well trained persons and he is certain that their use is fully justified in the probation office procedure.

This test has been modified by Larson in the School for Police in Berkeley (75). Instead of feeling the pulse he employed a stethoscope and he took a pneumographic record simultaneously with the blood pressure. The time and exact moment of asking questions were recorded separately upon two drums. Questions relating to the alleged offense were presented in printed form upon a rotating drum. By the aid of this apparatus Dr. Larson has cleared up a puzzling case of theft.

There is no let-up of interest in eugenics. Dr. Holmes has done a great service by publishing an extended bibliography (68). It is not only for the improvement of the race but for the prevention of crime that segregation and sterilization should go hand in hand (11, 76).

There are nearly a thousand pages in the two volumes of proceedings of the Congress on Eugenics in New York in 1921. Differential fecundity, inbreeding, special strains, control of human matings, family traits in relation to social conditions, relation of eugenics to racial, economic and social problems such as immigration, race mingling, population, marriage, parenthood, sterilization, disease and education, a catalogue of a comprehensive program of papers and addresses.

The preparation of a social background or atmosphere through general and special education that will minister toward the prevention of crime will always quite properly occupy a large place in the public thought. This has already been referred to in connection with the Leopold-Loeb case. With this in view Cox has made a new departure in preparing a text in ethics (23). It is his aim to

teach ethics by the case method; and he has drawn upon court situations for his material. Unfortunately the examples of conduct he employs are restricted in scope, elemental, and they lack subtlety in the moral situation. But the book is a case of pioneering in a most wholesome direction; that of forming the mind of the general student.

The training for the public profession of the law (100)—to speak of special education—could take profit, as Justice Villamor of the Philippines urges (121), from a post-graduate course in criminology and medical jurisprudence. But this is written, not with a view to bolstering the morale of the profession but with an eye to the preparation of jurists to handle the testimony of medical experts.

Criminal law has certain societal aspects: they are economic, sociologic, psychologic and philosophic (78). The law must be administered with regard to them. It is probably the recognition of this fact that has led to the socialization of court procedure, to enlarging the police power to secure the general welfare and to the creation of new tribunals to perform community obligations. It has led also to the serious question how far court procedure can be socialized without impairing individual rights (129).

The discussion of these matters on the part of the most active thinkers in the legal profession is possible only because a multitude of more or less careful analyses of social problems have gradually taken hold of members of the bar. Serious discussion of criminal responsibility is rooted in the same soil. The best of the bar recognizes that the ancient legal tests of responsibility rest upon medical theories that are now obsolete (73, 87) and with which the scientific knowledge of the present day is in sharp conflict. Professor Keedy is responsible for a measure that does away with the legal definition of insanity. The medical witness will testify as to the mental condition of the defendant at the time he committed the act with which he is charged. The judge will then describe to the jury the mental element involved in the crime as charged, and the jury will decide whether the defendant as a result of the mental condition portrayed by the witness had the mental state as described by the judge.

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RIVERS, W. H. R. *Medicine, Magic, and Religion.* N. Y.: Harcourt, Brace, 1924. Pp. viii+147.

In 1915 and 1916 Rivers delivered the Fitz Patrick Lectures in London but delayed their publication in book form with the intention of writing at leisure a comprehensive treatise on *Primitive Medicine.* Death frustrated his purpose; and G. Elliott Smith has now brought out these lectures, together with a later one (1919) on *Mind and Medicine.* Thus we have here, in the words of the author, certain prolegomena to the early history of medicine. The chief aim of the book is, "by means of relations between medicine, magic, and religion, to illustrate the principles and methods which should guide and direct the study of the history of social institutions" (55).

The first chapter treats of the relation of medicine to magic, and the second of the relation of medicine to religion. The term religion is defined, satisfactorily as it seems to the reviewer, in such a way as to make rites of supplication and propitiation its characteristic mark. The sentence, "Religion differs from magic in that it involves the belief in some power in the universe greater than that of man himself" (4), is, however, confusing. When writing it, the author seems to have lost sight of what is obviously for him the essential difference between magic and religion. That difference is not one of the "greatness" of the powers involved, but of their nature; it is a difference in the *nature* of the means by which man seeks to influence the animate or inanimate world about him. Coercing spirits of gods or any other agent is magic, whatever or whoever the agent using the coercitive power may be; while making an anthropopathic appeal to these spirits or gods (*i.e.,* supplicating, propitiating, and the like), is religion. The difficulties which may be encountered in disentangling, in any particular ceremony, these two different processes does not do away with their fundamental difference.

Among savage peoples the causation and the cure of disease is usually understood in a magical or a religious way. When a man is killed by a branch falling from a tree or in battle, the event is put to the account of a sorcerer who is accused of having timed the fall of the branch or of having guided the missile so as to encompass his end.

According to the savage there are three causes of disease: "those

in which some morbific object or substance is projected into the body of the victim; those in which something is abstracted from the body; and those in which the sorcerer acts on some part of the body of a person or on some object which has been connected with the body of a person." These three classes are considered in detail.

A very close connection exists in Melanesia and elsewhere between disease and taboo, itself belonging to the cult of the dead. We are told that, for instance, in the little island of Eddystone, where the author spent several months, nearly every disease is ascribed to the infraction of a taboo on the fruit of certain trees. In the curative rites the religious element is obvious: "the note of supplication runs through all the formulas."

There are, however, also a great many disorders—the minor and more ordinary ailments, which do not endanger life—the cause of which is regarded as neither magical nor religious. They are said to come of themselves and do not require for treatment the aid of any specialized practitioner. Rivers remarks that it cannot be concluded that these disorders are regarded as having a "natural" cause. Nevertheless, he records that there is in Africa a widespread belief in the production of disease by natural causes, and a genuine art of medicine, especially among the Bantu peoples (*70, 72*).

Thus the consideration of the causes ascribed to disease by the savage and of his methods of cure, brings out an intimate connection between three sets of processes (magical, religious, and "natural") which are clearly separated by the civilized. And the curative practices appear not as a medley of disconnected and meaningless customs but as quite rational: "Their modes of treatment follow directly from their ideas concerning etiology and pathology" (51). If a person has fallen sick because a part of his soul has been abstracted by some sorcerer, the cure is to be effected by getting hold of, and restoring that part to the sufferer. When lack of consistency appears, it is due to a mixture of different cultures that have not been unified.

The second half of the book (Chaps. III and IV, pp. 55–117) is an historical and evolutionary treatment. It is devoted mainly to a consideration of the mechanism by which the relation between medicine, magic, and religion has come into being. Here the author meets the two theories which still divide the students of Culture. They may be roughly expressed thus: (1) the same cultural traits have originated in different places at different times; (2) diffusion of cultural traits has taken place from one center to various parts of the earth. The influence of G. Elliot Smith and W. J. Perry of Manchester

University upon Rivers is in evidence. He has now come to realize very clearly the serious difficulties in the way of the independent-origin hypothesis and has perceived something of the plausibility of the theory of these men who look to Egypt as the origin of a vast complex of culture-features which have spread to almost every part of the earth (57).

After a brief survey of the relations of medicine, magic, and religion, in various countries, the conclusion is reached that although great similarities exist all over the earth "in the general character of the beliefs concerning the causation of disease" (76), differences such as the following are nevertheless observed: the production of disease by the abstraction of the soul or part of the soul appears to be limited to Indonesia, Papuo-Melanesia, and America. India and Africa, on the other hand, are preëminently the seat of the belief in the production of disease by possession. It seems to the author difficult to account on the basis of the independent origin of diseases (which are everywhere about the same) for these differences, and still more difficult to explain the coexistence of beliefs so far different where, as in North America, they are found together.

The difficulties which the independent origin theory has to face become well nigh insuperable when one considers the remedies of the domestic order, the "natural" remedies. The lowly Papuans practice five modes of treatment found widely distributed over the earth: poulticing, blood-letting, massage, vapor-bath, and counter irritation. And "these practices stand apart from the system of therapeutics based on the belief in the production of disease by human or spirit agency which bulks so largely in the minds of the people" (83). When we recall that we ourselves have acquired, not discovered, these practices, each from a different source (bleeding from the Greeks and Arabs, vapor-bath from the Turks and Russians, etc.), it becomes impossible to credit the Papuans with the independent invention of these several forms of treatment.

In chapter IV is formulated a principle for the guidance of the student of the history and evolution of Culture, and several interesting illustrations of its workings are given. The principle reads: "Transplanted elements of culture tend to take root in a new home in so far as they are in harmony with the physical and cultural nature of their new environment, and, if they succeed in taking root, tend to become modified in the direction of the indigenous culture by which they are assimilated" (92).

With regard to the methods used in the treatment of disease,

Rivers hopes to have shown that the hypothesis of independent origin "furnishes a very inadequate explanation of the wide distribution of these practices," but he is aware that he has "not been able to bring forward any absolutely conclusive evidence in favor of transmission, nor, when transmission seems probable, . . . any one movement of mankind as its vehicle" (108). His object has been "mainly to suggest problems and consider the principles which we must follow in attempting their solution." None, it seems to the reviewer, will be inclined to deny that that task has been successfully performed.

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BERNARD, L. L. *Instinct: A Study in Social Psychology.* N. Y.: Holt, 1924. Pp. 550.

If the author called his book on instinct a study in social psychology, it is evidently not because its content closely resembles that of other books on social psychology, but because he believed that an acceptance of his point of view would alter materially the development of social theory and social policy. He draws attention to the fact that although almost all those who write about social and educational psychology begin with analyses of the instincts, nevertheless, when they come to the constructive parts of their writings these analyses and the principles derived from them are mostly abandoned. In Bernard's opinion, these authors start with instincts because they believe not only that the instincts underlie all of the complex developments of social and individual life but also that they are the principal factors determining the direction of these developments. And, if later on, they disregard their early discussions, it is because they find that their results are not helpful in a treatment of the educative process and of the organizations of social life; for, the "instincts" discussed by these authors are really acquired habit-complexes which are determined very little by the reflexes, real instincts, and random movements out of which the so-called "instincts" arise, but are determined largely by the psycho-social environment in response to which they develop. Therefore the author believes that social and educational psychologists should primarily study the mechanisms by which the citizen and the child build up their habits on the basis of their instincts and the way they transform one habit, or one set of habits, into another.

The book will probably not be as useful to psychologists as it might be because so much of it consists of an attack on the concepts of instinct held by writers in other fields and by popular writers in psychology. Thus, because Mr. C. B. Davenport speaks of an "instinct of criminality," we find the whole thirteenth chapter devoted to a painstaking analysis and criticism of that alleged instinct. We also find that chapters VII, VIII, and IX, which the author himself believes to "contain the major portions of the concrete results of the investigation" consist of an analysis of the usage of the term instinct by 412 writers, including Milton, Zola, Mark Twain, and the Minneapolis *Daily Journal*. In chapter IV he makes an "attempt to establish a definition of instinct sanctioned by the most authoritative contributions to the subject as a point of departure for the remainder of the book." This chapter quotes the definitions of the leading psychologists and also those of Veblen, Trotter, and of The New Standard Dictionary, and then makes much of the fact that these definitions do not all agree. The only definition which he himself gives is the following: "An instinct is an inborn (in the sense of inherited) activity process which has remained intact, that is, which has not been remade through the process of learning or of making new adjustments by means of the substitution of new stimuli or responses for the old which was inherited" (p. 84). With only a few exceptions he adheres to this one-sided point of view and insists that an instinct-habit complex should always be called a habit and in no sense an instinct. On the basis of this definition he proceeds to criticize various views to show that even the writers who "define instinct properly, as an inherited automatism, or stimulus-response process, . . . deviate from their definition in their actual usage." One may therefore be surprised to find in the midst of this criticism the following statements: "The vocal responses to the child's cries—the responses of the mother as well as the cries of the child *which are instinctive*—apparently have in their native form merely the power to produce useful movements or silence or vocal action in the offspring or to frighten off the enemies of the child. Silence produced by soothing monotony in the mother's voice or by the shock from the shrillness of her cries may have survival value for the child. The young of some animals scurry hastily to cover upon hearing the mother give a certain signal, which is evidently effective because of its emotional significance. Other signals call the young to partake of food" (italics mine. P. 330). And a little further on we find him speaking of "instinctive forward movement and fondling caresses

of the mother in response to the cry of the child". Many psychologists would hesitate to agree with him that there is no learned element in the child's useful movements or silence or vocal action in response to the stimulus of the mother's cries, or that the mother's fondling movements or her approach to the child when it cries are wholly instinctive and not in any sense learned. He seems to have fallen into the same error which he criticizes, *i.e.*, calling "instincts" those responses which consist in instincts modified by learning.

For Professor Bernard's thesis is that the activities usually called instincts, such as the maternal instinct, reproductive instinct, gregarious instinct, are really not instincts at all but rather habit-complexes, determined primarily by the pressure of the psycho-social environment; that the real instincts are some hundreds or even thousands of inherited mechanisms, including reflexes, which do not usually function independently but are organized into larger habit complexes under the pressure of the psycho-social environment; and that the nature of these complexes is primarily determined by that environment and not by the nature of the instincts out of which they are formed. This thesis he develops in four ways, first by a study of the phylogenetic development of the nervous system, second by an examination of the current usage of the term instinct, third by a brief examination of the nature of heredity, and fourth by a study of certain specific instincts to show that they are really habit complexes.

In his first line of argument the author states that the autonomic nervous system is the most primitive nervous system and the one principally involved in the reflex and instinctive acts: "Because of its early origin and its simple and highly standardized or fixed functions in promoting and conserving the vital processes, more definitely inherited processes or connections are found in this autonomic system than in the remainder of the nervous organization. This is the true and original home of the reflexes, instincts and tropisms" (p. 45). Later in the development of the race appears the cerebrospinal system and especially the cerebral cortex, which he calls "primarily a habit or acquired system," and which "has come in the more advanced human epoch to be under the dominance of man's psycho-social environment, which we call civilization." He claims that with the development of this cerebral cortex the controlling function ceased to be inherited and instinctive and became acquired and habitual. The whole force of this argument depends on whether one grants his

premise that the instincts are localized principally in the autonomic system. No argument is offered in support of this position.

Professor Bernard next proceeds to a study of the current usage of the term instinct to show the variety in that usage and the general lack of critical standards. He quotes in chapter VIII the classifications of instincts made by a number of psychologists, criticizing them because they overlap and because they give no method or power of distinguishing between the elements which are inherited and those which are acquired. In chapters VII and IX he presents the results of an analysis of the works of more than six hundred contemporary writers to ascertain the usage of the term instinct. As might be expected he finds the greatest lack of agreement and standardization. He reports 5,759 different classes of instincts, mentioned by 412 different authors, in 495 different books, and totaling 14,046 separate cases. Chapter VII begins oddly enough with a criticism of the use of instinct in Milton's " Chariot instinct with fire " and Wordsworth's " genius instinct with music," and fifteen like examples. Surely the author does not know that " instinct " may be used as an adjective meaning merely " imbued, animated, alive," or he would never have criticized these authors for " an unscientific use of the term . . . usually confined to the litterateurs untrained in the scientific terminology of psychology."

Most of the third line of argument offered by Professor Bernard in support of his thesis proceeds from a consideration of the nature of biological inheritance: Nothing could be inherited which was not determined in the chromosome structure of the reproductive cells of the parents of the individual in question, and nothing could be so determined which was not a structural organization. Would not an insistence on this simple principle do away with much of the incorrect usage of the term instinct?

The fourth and perhaps the strongest argument of the author is contained in chapters XIII to XVI where he analyzes certain so-called instincts, the instinct of criminality, maternal instinct, play, fighting, and others. He does not seem to be aware that his list contains some " instincts " which few, if any, psychological authorities would recognize as instincts. He shows that several of these examples are confused mixtures of inherited and acquired traits. Each of them is an aggregate of many totally different responses to many totally different stimuli, which cannot possibly be formed into a neuromuscular unity and therefore cannot have a unit biological character; they must have been formed into a unity by the pressure of the psycho-social environ-

ment because they are somewhat alike in their results when viewed socially and morally. He claims further that exactly the same acts often enter into several so-called instincts; for instance of the many acts performed in play, some are like those performed in fighting, and others are like those performed in construction. The author argues that this condition is inexplicable if fighting, play, construction, and so forth, must be considered hereditary units, but easily explicable if they are acquired complexes, for then it is only necessary to assume that there are certain unit-movements of hand, of wrist, or arm, of body, of eye, of voice, which are hereditary, and that these are organized through a learning process which is guided by the needs of the psycho-social environment into various forms of activity. In the last two chapters Professor Bernard attempts to prove that the affective life is not predominantly instinctive.

In so far as the author of this book merely points out acquired elements in all so-called instincts, he is adding nothing new to our understanding, for all psychologists would doubtless agree that after earliest infancy in man and in the other higher animals there are few, if any, " pure " instincts, wholly unmodified by experience. In so far as he insists that in accounting for these habits, built up on a basis of reflexes and instincts, more emphasis should be placed on the environment and particularly on the psycho-social environment he is doubtless correct; and in so far as he suggests that social and educational psychology should give up their preoccupation with instincts and find their starting-point in an analysis of the learning and habit forming processes and in an investigation of the way in which the psycho-social environment, the customs and culture which man has built up, form and modify all the reactions of each new individual born into this society, he has pointed out a possibly more fruitful path for them to follow. But in so far as he implies that these reflexes and instincts and random movements, on the basis of which the complexes so often called instincts are built, are themselves absolutely unimportant and insignificant, he is falling into the extreme position that man is at birth a mere tabula rasa, that particular individuals and particular races are wholly plastic to the pressure of the psycho-social environment—a position to which even those who are not extreme instinctivists will probably object.

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LEUBA, JAMES H. *The Psychology of Religious Mysticism.* London: Kegan Paul, Trench and Trübner. New York: Harcourt, Brace and Co., 1925.

The literature of mysticism produced by our century is already reaching formidable proportions. A large part of it is devoted to what is called the "psychology" of mysticism. Judging from the mass of these works we ought by this time to have a rather exhaustive knowledge of the psychology of the mystics. As a matter of fact, it must be said of the considerable majority of the writers involved that their acquaintance with the mystics has been limited and their acquaintance with psychology has been minimal. In our days psychology is a word to conjure with; and the conjurers have been many. As so often happened in the days of magic, they have raised a spirit which they do not understand and which they can not control.

The writers who have treated of mysticism in a manner that can truly be called psychological in the exact and modern sense of that word could be numbered on one's fingers. For years Professor Leuba has been prominent among these few; and it is hardly too much to say that his most recent contribution to this field has made him primary among them. Back in 1902 he wrote for the *Revue Philosophique* two long articles on the "*Tendances Fondamentales des Mystiques Chrétiens,*" which the more serious students of the subject at once recognized as containing perhaps the most careful and exact psychological analysis of the mystic consciousness that had yet appeared. As a result of the promise given by these articles and by his two books, "A Psychological Study of Religion" (1912) and "The Belief in God and Immortality" (1916), students of the psychology of religion as a serious and scientific pursuit have eagerly been looking forward to the appearance of the present work; and in the opinion of the reviewer at any rate, the book amply fulfills these high anticipations. Professor Leuba's reading of the literature of mysticism has been wide and careful. He is, as everyone knows, an experienced professional psychologist. And what he writes about mysticism is neither theology nor philosophy nor poetry, but psychology in the exact sense of that term.

The book begins (after an introductory chapter) with an analysis of mystical ecstasy as produced by drugs and other physical means; and this is followed by a chapter on the Yoga system of mental concentration and the mystical experiences resulting therefrom. With the results of these studies in mind, showing as they do the sort of

thing that can be produced by purely physical and psychical methods, he proceeds in the chapters that follow to examine in detail the facts of Christian mysticism. The author's purpose is to show that *considered as psychical phenomena,* the mystical ecstasy, trance-consciousness, etc., do not differ in anything essential from the non-religious phenomena studied in the introductory chapters. Professor Leuba is at pains to point out that Christian mysticism does differ enormously from drug-mysticism and Yoga mysticism in moral motivation, in interpretation, and in the uses to which it is put. But from the point of view of immediate and analyzable character and of psychological causation, the same general principles (in his opinion) hold for both.

Most of the cases of mysticism studied are drawn from the great mystics and are therefore of the rather extreme type. But the milder forms of mysticism also receive some attention, notably the "sense of presence." In fact, one of the best pieces of psychological analysis in the book is the analysis of this sense of invisible presence and divine guidance. Much the same might be said of the author's treatment of illumination and inspiration, religious, artistic, and scientific. Both inspiration and the sense of presence are analyzed into their elements, causally explained, and related to non-religious and non-marvelous experiences, some of which are matters of common knowledge, some of which Professor Leuba has been able to bring about by experimental methods in his laboratory.

There are several points of special interest to the technical student of the psychology of religion which in a longer review than this should have special treatment. There is, for example, room for much discussion over the place assigned to sex in the mystical consciousness. Although Professor Leuba is very far indeed from attributing to sex the exaggerated importance which many writers on religion give it, he is convinced that a great deal of the joy of the mystic ecstasy is to be explained by it and that "many of the curious phenomena to which most of the great mystics owe in part their fame are due to perturbations of the sex function consequent upon its repression." This position he expounded back in 1902, in the *Revue Philosophique* articles and in the present work he retains and elaborates the view. His thesis is that "there exists a connexion between the emotions of affection and the sexual activity; and that the sex organs may be aroused to a considerable degree without the person becoming aware of their participation." The last section of this thesis is essential to the identification of the joys of ecstasy with "intense attacks of erotomania"

in women mystics who, though they had had long experience of married life, failed to recognize anything sexual in the ecstasy. To validate his thesis Professor Leuba at times extends the word sex so as to include almost as much as the Freudian *libido*. The critic might be tempted to ask whether in so doing Professor Leuba has not proved too much. If mysticism is sexual only in the same sense as is all bodily pleasure, is it significant to call it sexual at all? It is only fair, however, to add that in most passages Professor Leuba means something much more specific by the word. And he is undoubtedly justified in tracing a part of the ecstatic delight to a sexual origin.

There are two points on which Professor Leuba dissents from the views of Delacroix, who is perhaps his most able predecessor in the field of the psychology of mysticism. He fails to find the regular rhythms of the mystic life (to which Delacroix devoted so much exposition in his great work)and he insists that the final stage of the great mystics was not of the passive and automatic sort that Delacroix had described. Lack of space forbids discussion here of these nice points, and the reviewer can only register his own conclusion that on both these matters Professor Leuba is absolutely right.

As has been indicated, the aim of this book and its method are primarily psychological. But in discussing a field so central to religion and to the philosophy of religion, it is, of course, impossible for the author to avoid recognizing the philosophical implications of his conclusions. It is probably on these by-products of his book that Professor Leuba will receive the greatest amount of criticism. Particularly will discussion center on his distinction between the immediately given and the mystic's interpretation of it. One may well ask, is the given ever so pure as to be free from all interpretation? Is not interpretation in some sense a part of the given? Are not all percepts "sign-facts"? And if this is so, is the matter so simple as Professor Leuba seems to suppose? Lack of space prevents a discussion here of these interesting questions. It should, however, be pointed out, in anticipation of the attacks the book will probably receive, that Professor Leuba is by no means unappreciative of the value of mysticism in its milder forms, nor unsympathetic with the great mystics—for whom, in fact, he manifests at times a great admiration. And the severest of his theological critics, it is to be hoped, will at any rate recognize his scientific honesty and his loyalty to the truth as he sees it.

JAMES BISSETT PRATT

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SUTHERLAND, E. H. *Criminology.* Phila.: Lippincott, 1924. Pp. 643.

Written as a volume in Lippincott's Sociological Series, the present text is an elaborately documented survey of present knowledge and opinions as to the effects, causes, treatment and prevention of crime. Some 450 different writers and investigators in fields related to these topics are cited.

The Introductory chapter presents criminology as a subdivision of social psychology. "Human nature is a group phenomenon, not merely an individual phenomenon. Crime and all the social policies connected with crime belong to this field of human nature. . . . Consequently it is essential to have a fundamental science of human nature in order to control such policies effectively" (p. 27).

Reservations with respect to the psychiatric approach to criminology are expressed by Sutherland. He deprecates "unilateral explanations such as those of the economic determinists, and of some eugenists and psychiatrists" (p. 27). He points out that "it is frequently reported that a specific part of the criminal population is found, on examination, to be psychopathic, and that this trait is therefore extremely important in the causation of crime. But no one knows how large a percentage of the general population would also be found, by the same tests, to be psychopathic. The logic is identical with that of an investigator who might find that 60 per cent of the prisoners had blue eyes and assert that blueness of eyes is an extremely important cause of crime" (p. 80). He classifies mental disorders into (a) psychoses, (b) intellectual deficiency, (c) epilepsy, "and perhaps (d) the psychopathies" (p. 124).

He does not, however, disregard psychopathic causes of crime. We read, for instance, on page 121:

"The attempt to suppress any tendency entirely, frequently produces a conflict between the tendency and the inhibition that may influence personality in most important respects. Healy has made a distinct contribution in his analysis of mental conflicts in connection with delinquencies, and cites many cases of delinquents whose difficulties can be traced to this condition. Some of the most difficult cases have been quickly modified when the source of the difficulty was discovered. The conflict seems to appear most frequently in connection with sex tendencies, but are not limited to them."

Pertinent criticisms of shortcomings in the application of statistical methods to the study of crime are presented. The lack of any dependable index of the prevalence of crime is pointed out. Of

Laughlin's *Analysis of America's Melting Pot,* he says, "In general this study is quite misleading in its conclusions because of the failure to take account of differences in composition and distribution" (p. 99). This criticism might well have been more severe.

Yet, admitting fully the present defective and rudimentary condition of criminological statistics, the reviewer cannot follow the author in his attitude toward the utility of the statistical method in determining the causes of crime. He urges: "that we should have information that will enable us to state that a person with such and such a nature or such and such attitudes in such and such a situation will always become delinquent. Perhaps it will never be possible to construct such laws, but it is certain that the statistics of traits of criminals will not carry us very far in that direction" (p. 82).

One need not reject the services of vital statistics because they do not predict just which individuals will succumb to typhoid, influenza, or smallpox. Why then set up impossible standards for criminal statistics?

Sutherland proposes individual case study as the method of arriving at scientific conclusions. He holds that "the methods differ, not in that one is statistical and the other one not statistical, but in that the individual is the unit in one, and the abstracted trait or condition is the unit in the other" (p. 82).

To the statistician this is a perplexing statement. Miss Anne Morrison, psychologist at the Slayton Farm for delinquent girls, advises me that 62 per cent of the 340 girls admitted to that institution in 1922 and 1923 had Stanford-Binet intelligence quotients of 75 or under, as compared with less than 3 per cent among the 905 unselected children tested by Terman. Subject to certain reservations in interpretation, these data suggest that mental deficiency enters prominently into the causal chain resulting in commitment of girls to this institution. In this comparison the unit of enumeration is the child, and these units are classified in accordance with certain traits. In what way would the author propose to change the procedure? If he means to propose the analysis of several different traits at the same time, how would he modify the statistical procedures of partial association or partial correlation which have been devised for dealing with just such problems? He says (pp. 82–84): "The comparison might be expressed better, however, if it is recalled that the purpose of the comparison of home-indices of criminals and non-criminals is to determine the importance of home conditions of specified kinds in producing delinquency; while the purpose of the individual case

study is to determine how and why certain types of homes produce delinquency, how they produce delinquency rather than how frequently they produce delinquency. . . . On the basis of such studies of the traits and situations of the delinquent, an effort is made to select the ones that *seem to be instrumental* in producing the delinquency" (italics mine).

This sort of analysis apparently consists simply in the application of common sense interpretations to more or less systematic observations. Such procedure is immensely valuable as a preliminary to more accurate definition of variables and to statistical analysis of their relationships; indeed statistics cannot proceed fruitfully except in coöperation with commonsense formulation of hypotheses. Yet it must always be remembered that these cruder methods are open to a great variety of dangers in the way of bias, hazy definitions of terms, generalization from inadequate data, and other logical fallacies. Statistics is a technique calculated, if properly used, to safeguard reasoning from some of these sources of error.

Issue might be taken with Sutherland's implication on pages 19, 21 and 25 that scientific treatment of criminals would require the abandonment of the attitude of blame toward offenders. Blame and punishment have legitimate functions in so far as they are effective in preventing crime. They are not legitimate toward the insane or the feebleminded in so far as they cannot influence the insane or feebleminded toward social conduct.

The above criticisms must not be interpreted as denying the worth of Sutherland's book. Its comprehensiveness, its modern point of view, its interesting style, and its extended bibliography make it a valuable addition to the literature of criminology.

HORNELL HART

Byrn Mawr College.

DELACROIX, H. *La Religion et La Foi.* Paris: Alcan, 1922. Pp. xii+451.

This book is not concerned with the origins of belief but rather with the several forms of religious faith: Implicit or Naïve Faith, with the several Faith, and the Faith of Trust (confidence).

The influence of the religious society and of the practice of the religious rites constitutes a double source of Implicit Faith (pp. 1–91). The former, called by Delacroix the *culte extatique,* is con-

cerned with the exciting effect of the crowd; it gives rise to confused states of mind which lend themselves to a spiritual interpretation. Delacroix indicates how such practices (dancing, singing, etc.) generate faith by referring to the principal laws of the action of crowds.

The latter, named here the *culte méthodique,* is a ceremonial discipline which also generates faith, since attitudes, gestures, expressions of feelings are themselves sources of feelings. Moreover, sacred objects have in themselves a power of exciting faith. A belief in the spiritual efficacy of sacred objects and rites is found in every elementary religion. An extreme form of the belief in the external objective power of certain practices is magic. Delacroix understands the genesis of magic thus: Magic is founded in desire, a desire for some particular good. Now desire naturally translates itself in spontaneous gestures, movements, words. The accidental fulfilment of the desire (a thing which may easily happen sometimes) becomes associated to such movements and words. Founded in desire, magic sustains itself by accidental successes—sometimes inevitable, as for example, rain after a period of dryness.

Sacrifice and prayer are both treated as special cases of magic: sacrifice because it pretends to exert a coercitive action on the gods; prayer because it is an attempt to compel the gods by the use of language, and because, moreover, prayer originally grew out of ritual (*i.e.,* magic). Delacroix here fails to distinguish between two types of behavior: anthropopathic (involving the recognition of a personal relation), and coercitive behavior. Prayer is essentially a case of the former.

Delacroix' view that prayer is a particular case of magic is allied to his belief that ideas of unseen personal beings are rooted in ideas of impersonal powers. This is the viewpoint of Marett and Durkheim. Delacroix says: "Un Dieu impersonnel, sans nom, sans histoire, immanent au monde . . . . telle est la notion sur laquelle elle (magie) repose. . . Il semble bien que les êtres sacrés se soient formés de cette matière sacrée par une sorte de condensation." Here, as also in the confusion of magic with religion he fails to take into account the analyses of Professor Leuba.[1] Delacroix offers no

[1] Professor Leuba makes this distinction and uses it to differentiate magic from religion, taking the point of view that in the making of definitions we are concerned with what is differential, and that between magic and religion there is a clear difference in psychological attitude—magic seeks to compel by force, while religion seeks its ends by person relations: the former would coerce, the latter would persuade by gifts, supplications, etc.

factual evidence to support his view; indeed he says that he prefers not to consider deeply the debated and difficult problem of the historical and logical relations of magic and religion.

A superior form of belief is that into which reason enters; it is called by the author the *Foi Raisonnante* (pp. 92–188). Implicit Faith is the faith of many; it accompanies and sustains the Faith of Reason. The degree of rationalism present in religion varies from an extremely diluted rationalism to a very pure rationalism. The latter tries to demonstrate everything: the existence of Jesus, His miracles, the existence of God, etc.

The following are the modes of combination of reason and revelation which produce this type of faith: (1) The naïve confusion: contrary theses are accepted without reflection. (2) The learned confusion: the believer has the *impression* of comprehending the incomprehensible. (3) The conciliation: the believer supposes that there are two orders, the natural and the supernatural, and he makes the conciliation between them either at the expense of reason, of which he proclaims the inferiority, or at the expense of dogma, which he tries to adjust to the demands of science. (4) Finally, there is the willing acceptance of the contradiction (La foi a travers la contradiction et le scandale): the contradiction is taken as the sign and as the essential condition even as of faith.

The Faith of Trust (*foi confiance*, pp. 189–245) is very different from Reasoning Faith. The former takes dogmas as being contingent, local, changing expressions of religious experience, as having a symbolic value only. This form of faith is not rare, Pratt found it in 37 per cent of those who responded to his inquiry. It is one of the important forms of Protestantism, and is represented in the Catholic Church by the school known as Modernism—a school which is, first of all, one of historical criticism. Recognizing the value of the objections that science and reason offer to faith, it nevertheless holds that there does not need to be any conflict between faith and science, nor between faith and history, since the object of faith is not matter of science nor history, but of moral experience.

With Book 2 the author passes to an analysis of what he calls acute states of faith, *i.e.*, mysticism (pp. 247–284), prophetic inspiration (pp. 285–312), and fanaticism (pp. 313–322). Following this he investigates faith in its evolution (conversion) and its dissolution (doubt), and then in a final chapter seeks to show how creative faith behaves in the formation of religious ideas.

By mysticism Delacroix means pretension to mysterious revela-

tion and intimate union with unseen beings. Faith tends naturally toward mystic contemplation; he who has faith feels always that this faith comes not only from himself but also from the object in whom he has faith. In his analysis of ecstasy there is little that needs to be mentioned here. He has treated this topic more extensively in *Etudes d'histoire et de psychologie du Mysticism.*

Ecstasy is not confined to the domain of religion, nor is inspiration. Whenever a new idea breaks through the course of consciousness and presents itself with an appearance of spontaneity and independence there is a case of inspiration. Inspiration is the play of processes that we would not identify with ourselves.

Conversion (Book 3, Chapter 1, pp. 323–373) is not treated in detail. The author is interested only in conversion regarded as faith. Conversion *is* faith—"a painful, tumultuous, dolorous faith". It does not always involve a crisis: it may be simply a slow, voluntary progressive formation of belief, a change in point of view. Still the very word conversion implies a conflict of some sort. It is a renouncement, an interruption, a rupture between the me before, and the me after, a reorganization of the moral life around a new principle. The subject has a sense (1) of entering a larger life, (2) of emancipation from self, (3) of a change which has taken place in him; a change brought about, not by a simple internal process of psychological development, but by the operation in him of something stronger than himself. In the manner of its development conversion is like passion. It is like passion also in its violent antitheses, and its profound indecisions. And both conversion and passion are creations of new values: a recovery of self in the object, an afflux of energy, and full gift of self to a single task.

In the second part of the last chapter (La foi creatrice, pp. 401–457) Delacroix searches briefly the rôle which faith plays in the formation of religious ideas, *i.e.*, in the constitution of dogmas, myths, and rites. These are perhaps the richest pages of the book. But, since they are given as preliminary remarks to be taken up and developed at some future time, the reviewer may be excused for saying no more.

Professor Delacroix writes in an easy, attractive style and his discussions are illumined by an abundance of illustrations taken mainly from recent Roman Catholic and Protestant history. One finds in this large and substantial volume not so much exhaustive studies of a few fundamental topics than a comprehensive examination of the interrelations of reason and feeling in religious life, and

of their rôle in the formation and the destruction of religion. An intimate acquaintance with the various forms of religious life and with recent religious history, combined with a masterly understanding of the human mind, assign to this book a foremost place in the literature of the psychology of religion.

DOROTHY DURLING

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RÉVÉSZ, G. *The Psychology of a Musical Prodigy.* N. Y.: Harcourt, Brace & Co., 1925. Pp. x+180.

In the present volume Révész has brought together his observations and experiments on the musical talent of Erwin Nyiregyházi, a pianist and composer whose extraordinary achievements in music at a very early age justify calling him a musical prodigy. Nyiregyházi was born at Budapest in January, 1903. Révész began his examination of Erwin in the spring of 1910 and continued his investigations during the three following years.

The early musical achievements of Erwin were similar in many respects to those of the child Mozart. He was not one year old when he tried to imitate singing. In his second year he was able to reproduce simple melodies correctly. A year later it was discovered that he had absolute memory for pitch. By the time he was four years old he played the piano well, improvised easily, and composed little melodies with accompaniment. Systematic instruction in music began when he was five and continued without interruption until his twelfth year when he left his native land for concert tours which took him to most of the countries on the continent, to England, and later to this country. His musical development during this period, both on the interpretative and creative sides, was astonishing in its rapidity and breadth.

It is often supposed that musical talent stands in less close relation to the general level of intellectual development than does creative capacity in the other arts, and especially in the sciences. One usually points to the childhood accomplishments of some of the great musicians in support of this view. It is interesting to note, however, in this connection that Erwin's general intellectual capacities, as determined by variations of the Binet tests, were fully three years in advance of those of the average child of his age. This fact is significant when viewed in relation to the immaturity and thinness of Erwin's early compositions, remarkable as these truly are.

The bulk of Révész' book is taken up with descriptions and discussion of results of the tests which he used to determine the extent of Erwin's musical abilities. These tests ranged from fairly accurate ones used in the investigation of elementary acoustic and musical traits to much more rough and uncontrolled observations of the subject's ability in transposing, reading at sight, playing from full orchestral score, improvising, modulating, forming judgments as to relative merits of various pieces of music, composing, etc. It is trite to say that the results of these tests are interesting. If one has any interest at all in such matters he will finish the book at one sitting and will then play, or get someone to play for him, the twelve samples of Erwin's efforts at composition between the ages of seven and twelve which Révész includes in the final chapter.

The psychologist will be disappointed in Révész' book. It is obviously written with one eye, perhaps both, to the musical public; and in writing for such a public Révész has neglected too frequently the claims of his scientific colleagues. The book abounds in assertions which a psychologist would immediately challenge. In the introduction Révész states that he wrote the book for the purpose of throwing light on the great mystery of evolution and on the problems relating to the appearance of musical talent at an early age, the theory of musical genius, and the different aspects of musical talent and their investigation. One comes away from the book with the conviction that Révész has collected a wealth of extremely significant data, but also with the impression that the theoretical significance of the data and their bearing on problems in the psychology of music and musical genius could have been treated much more exhaustively. The purpose for which Révész says the book was written falls far short of realization.

C. C. Pratt

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NOTES AND NEWS

Dr. Helen P. Woolley, psychologist of the Merrill-Palmer School, Detroit, has been appointed director of the Institute of Child Welfare Research and professor of education at Teachers College, Columbia University.

At the meeting of the Western Psychological Association held at Berkeley, on July 24–25, the following officers were elected for 1925–26: President, Professor W. R. Miles, Stanford University; Vice-President, Dr. Kate Gordon, Southern Branch of the University of California; Secretary, Dr. Warner Brown, University of California.

Dr. M. J. Van Wagenen, of the department of educational psychology at the University of Minnesota, has been granted a year's leave of absence to accept an appointment as visiting lecturer in educational psychology and statistics at the University of California for the year 1925–26.

Professor Henry T. Moore, professor of psychology at Dartmouth College, who recently was elected to a professorship in the University of Michigan, has been elected president of Skidmore College.

Dr. Roswell P. Angier has resigned as dean of freshmen at Yale University, a position held since 1920. He has resumed his position at Yale as professor of psychology and director of the psychological laboratory and has also taken on the chairmanship of the Institute of Psychology of Yale University.

Dr. Frank H. Reiter, psychologist of the public schools of Newark, N. J., has been appointed Director of Special Education, Department of Education for the State of Pennsylvania.

Dr. H. M. Johnson, formerly assistant professor of psychology at Ohio State University, has accepted the incumbency of an Industrial Fellowship at Mellon Institute of Industrial Research of the University of Pittsburgh, where he will conduct an investigation of the psychological and physiological aspects of sleep. Dr. Johnson entered on his new duties June 15.

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THE
PSYCHOLOGICAL BULLETIN

PSYCHOPHYSICAL MEASUREMENT METHODS.

By Gilbert J. Rich
Chicago, Illinois

The period of approximately seven years since the last review of this field by Ruger (140) in 1918 has been marked by an increased interest in psychophysical methods and psychophysical laws. This increased interest has been marked not only by contributions to the fundamental bases of psychophysical procedure, as well as a large number of studies in the traditional field of sensory measurement, but more especially by the application of psychophysical methods, concepts and laws to the solution of new problems, new problems in the field of sensation, problems in other fields of psychology, and even problems in other sciences. In his laboratory manual, Pauli (115) includes a considerable number of psychophysical experiments, both in a section devoted to psychophysics and in the sections dealing with the senses. Lipps (100) publishes a third and enlarged edition of his "*Grundriss der Psychophysik.*" Titchener (152) gives a résumé of Mach's little known lectures on psychophysics. Kantor (83) believes that the psychophysical experiment may offer a basis for the reconciliation of opposing points of view in psychology (behaviorist and introspectionist). The analyses of this experiment from the two standpoints agree as to the initial event, the stimulus, and the final event, the verbal response. The intermediate terms are similar in name, but differently interpreted. If the introspectionists will abandon their supposedly epistemological background and become behavioristic in their interpretation of the psychophysical experiment, they and the behaviorists may be reconciled to one another.

Theoretical Considerations

Boring (11, 12) analyzes the logical basis of the use of the normal law in mental measurement. While the argument is concerned in large part with the use of the normal or Gaussian Law in the field of mental tests, it also has most important bearings upon psychophysics. Boring considers first the nature of probability and finds that it is not possible to establish the law of probability upon a deductive basis. The law is based upon ignorance, the absence of any reason why it should not hold, not upon cogent reason. Turning to the law of error, he finds that it is grounded upon definite assumptions, but that those who apply the law to particular cases do so uncritically, often failing to note whether or not the data treated are subsumed under the assumptions. The normal law of error has become a fetish, to which attempts are made to fit all data. But a long series of observations has shown that the law does not have the universal validity attributed to it. Boring shows elsewhere (13) that a distribution of the heights of 221,819 men is not "normal." As is evident in both psychometric functions and mental tests, the distribution obtained depends upon the unit used, so that in any mental measurement the form of distribution cannot be determined *a priori*. Thus Boring comes to the conclusion that there are not available any strictly psychological units save the sense distance, and it has not proved fruitful. Physical units (of stimulus or of behavior) are frequently used, but physically equal quantities or intervals are not psychologically equal. The only quantities left to the psychologist are rank orders of psychological quantities given with reference to an extrapsychological scale. Kelley (85) objects to this position because the logic of probability is a matter of inductive, not of deductive reasoning. He holds that probabilities are established as a result of previously observed frequencies, so that in the setting up of probabilities the evaluation of preceding experiences is the starting point in the process of increasing knowledge at the expense of ignorance. Kelley also points out that Boring's claim that the form of the distribution depends upon the unit of measurement does not hold true if the units are linearly related, but fails to realize that the type of relationship which Boring was considering (the common type in psychophysics) is nonlinear.

Boring (10) also calls attention to the fact that in psychological experiments one often obtains a mathematical value for the significance of the experimental result which seems to be "too high." The result is mathematically significant, but may not be scientifically

significant. This is because the experimentally obtained result is always the product of sampling and the scientist may feel that the sample does not adequately represent the phenomena to be described. The result obtained lacks scientific significance, not for the sample group, but for the larger group of which the sample is taken. Whether or not a result is significant is thus a matter of scientific intuition. Kelley (85) takes exception to this conclusion, holding that intuition is not a method of proof and that to disregard mathematical results is scientifically dishonest, for it means keeping and using data if they support an established conviction and otherwise discarding them.

Urban's "*Grundlagen der Wahrscheinlichkeitsrechnung und der Theorie der Beobachtungsfehler*" (156) has been reviewed in detail elsewhere in the BULLETIN (21, pp. 235–239). In it and in a more recent paper (158) Urban considers the relation between psychophysics and the theory of errors of observation. Klein demonstrated the existence in all physical measurements of a margin or interval within which all values of the standard of measurement appear equal to the unknown quantity, a margin which is determined by the quality of the instruments used and the accuracy of the observer's sense organs. It is customary to take the center of this margin, the mean of its upper and lower limits, as the value of the quantity to be measured. The margin corresponds to the interval of uncertainty in psychophysics and the central value to the point of subjective equality, while the process used to determine the upper and lower limits is identical with the one followed in the method of least perceptible differences. The finding of psychophysical experimentation, that the point of subjective equality (crossing of the psychometric functions) is the center of the interval of uncertainty, aids in the justification of the method of least squares as a means of adjusting physical observations.

Thomson (150, 22, p. 75f) questions the use of the interval of uncertainty (with "equal" judgments admitted and the threshold placed at 50 per cent) because it is a measure of a moral characteristic rather than one of physical sensitivity, since the observer can vary it according as he determines to give or not to give "equal" judgments. Instead, he suggests the interquartile range (75 per cent "greater" to 75 per cent "less," with no "equal" judgments) as a measure of sensitivity, with no determination of the limen. A comparison of results obtained by the two methods would throw light upon the explanation of Weber's Law. Boring (14) takes an opposite

stand on this issue. He holds that accurate control of the observer's attitude in a series of psychophysical experiments is both possible and scientifically necessary. Doubt, expectation and reflective judgments must be eliminated, largely by the establishment of definite serial categories of judgment and by the isolation of the single judgment, since Fernberger (40, 41) has shown that every judgment is influenced by the preceding report.

Mathematical Treatment

The outstanding contribution in recent years to the mathematical phase of psychophysics is the second edition of Brown's "*Essentials of Mental Measurement*," brought out in collaboration with Thomson ,(22). As this volume is the subject of a special review in the Bulletin (20, pp. 450–453), we can at this time only note the range of topics discussed which lie in the field of psychophysics. The first chapter considers such fundamental problems as the nature of mental measurements, the scale upon which such measurements can be made, and the nature and interpretation of Weber's Law. It is followed by a treatment of the elements of the mathematical theory of probability. The third chapter contains a more or less detailed account of each of the psychophysical methods. The constant method is given the major consideration, and the various mathematical devices for computing limens and measures of dispersion from the data obtained by it are taken up individually. Then follows a chapter on skewness and heterogeneity. Here Thompson applies Pearson's theory of curve fitting to psychophysical data, using both the Pearsonian skew curves and combinations of normal curves. He comes to the conclusion that his illustrative data are probably not homogeneous in character. The important contribution is the method of treatment, which is more extensive than that previously used in psychophysics. The remainder of the book is concerned with problems of correlation.

Two separately published papers by Thomson deserve mention. In one of these (148, see also 22, pp. 77–81), Pearson's method for testing for goodness of fit of curves is applied to data obtained by the constant method. This criterion differs from the one previously used by Urban to test the adequacy of various hypotheses in that it depends upon the weighted instead of the raw squares of the differences between observed and theoretical values, that the end result is expressed as a percent probability, and that a well fitting curve gives a high instead of a low value. In the other paper (149),

Thomson reviews the history of the Fechner-Müller-Urban process of computing the limen from the constant method (the *phi-gamma* hypothesis). He then deduces the same formulæ directly from the assumptions that for every stimulus there is a constant probability that the reaction in question will occur, that these probabilities are functions of the stimulus given by the integral of the normal probability curve, and that the observed values differ so little from the true probabilities that certain mathematical approximations may be made. This paper is especially valuable to the inquiring psychologist who has been unable to follow the logic and the mathematics of Urban and his predecessors.

Kelley (**84**, p. 373ff) publishes the "*Kelley-Wood Table of the Normal Probability Integral*" and shows (pp. 326–329) how it may be used in the computation of limens by the constant process. For this purpose he derives formulæ in terms of the variables of his table and shows that they are identical with those of Fechner, Müller and Urban. The Kelley-Wood Table has the advantage of reading to three decimal places (as against the two places of earlier tables), but its use involves the lengthy computations which are avoided in Urban's Tables.

Two devices for shortening the tasks involved in computation have appeared. Rich (**135**) prints a checking table to be used in connection with Urban's Tables for rapid checking of the necessary additions. Hoisington (**82**) contributes a table for the graphic check of the constant process with the least possible computation. It is a table of the probability integral arranged for this special purpose. It is also useful in computing the goodness of fit of psychometric curves according to either Thomson's (**148**) or Urban's method whenever the *phi-gamma* hypothesis is involved. Boring (**17**), Rich (**137**) and Davies (**32**) note errors in Urban's Tables and the necessary changes in Rich's Checking Table.

Urban (**157**) calls attention to observations by Hoisington and Thomson which indicate that the agreement between the observed values in a psychological experiment and the values computed according to the *phi-gamma* hypothesis tends to increase with practice. He suggests that this relationship could be worked out in detail from data already extant. Fernberger (**46**), acting upon this suggestion, computed the sums of the squares of the differences between observed and calculated values for two series of experiments with lifted weights. The sums of the squares of the deviations of theory from actuality appear to decrease with practice, although the change is not marked,

as the observers were highly practiced before commencing the experiments. Unfortunately, Fernberger failed to use the more satisfactory criterion for closeness of approximation of a curve to observed data that Thomson (48) has furnished. Boring (18) objects to Fernberger's conclusions on the ground that his figures do not actually show any effect of practice. Straight lines adjusted (by the method of least squares) to the values for the sums of the squares of the differences show increased approximation with practice in only two of the four cases, and the opposite effect in the other two cases. Boring thinks that this result is to be expected. Urban is trying to find in the *phi-gamma* hypothesis a generalized psychometric function. Such a function is impossible. No hypothesis can be general because it must always depend upon the unit of measurement.

Tinker (151) reports an experiment in the psychology of curve fitting. His observers were given the task of drawing the best fitting straight line through a number of points on coördinate paper. Although the observers did not work by or think in terms of least squares, their average results closely approximated the line of least squares. The psychology of adjustment appeared to be in part emphatic, but included the idea of equation of unsquared positive and negative deviations. An experiment of this type shows the inherent logical and psychological difficulties experienced in arriving at a satisfactory notion of what constitutes agreement in a curve fitting.

Weber's Law

Both the experimental and the interpretive consideration of Weber's Law have continued during the period under review. Harrison (75) prepared a series of colorimetric standards with solutions of safranin, starting with a concentration just visible and proceeding by steps just perceptible to the unaided eye. The increments in concentration required to accomplish this approached very closely to a geometrical progression, so closely that a calculated geometrical progression gave a Pearsonian correlation of .99 with the observed series. Similar results were obtained with solutions of luteol, methyl orange, malachite green and Bismark brown. Kiesow (88) reports the results of experiments by Gatti (56) and himself (87) upon the stimulation of hair-spots and concludes that Weber's Law holds, with a relative DL of about 1/7, within a middle range of stimulation. Putter (126) determined the DL for vision and found it to be an exponential function of the stimulus. He concludes that the Weber-Fechner Law is wrong and suggests that the intensity of

a sensation is proportional to the concentration of the irritable substance in the receptive system, a concentration which is an exponential function of the intensity of the stimulus. He further shows (127) that this chemical theory of stimulation may be applied to all living systems and to all stimuli which act by causing a quantitative, but not a qualitative alteration of the metabolism of the tissues affected. The phenomena of adaptation and after-image (128, 129) can be explained by the theory. In a later paper (130), Putter reports an investigation of the DL for temperature and finds that it follows his exponential law, not Weber's Law. Bühler (23) discusses and interprets Putter's results and conclusions. Fodor and Happisch (50) found that Putter's Law describes more adequately the relation of the DL to the stimulus in taste than does Weber's Law. Hansen (74) found that Weber's Law holds only partially for pressure sensations.

Chaffee, Bovie and Hampson (26) studied the electrical reponse of an excised frog's eye when stimulated by light. They found that for low intensities the response varies as the square root of the stimulus, while for medium intensities it varies as the logarithm of the stimulus. These results are interesting in that they offer a partial reconciliation of Cattell's and Fechner's formulæ for the relation of stimulus and sensation, each holding true within a limited range. Further investigation in line with this suggestion, that the psychophysical relation is to be expressed by a combination of two or more mathematical functions, merits attention. Since the response measured in this experiment was a physiological and not a psychological one (it involved no central factors), the data also cast light upon the interpretation of any psychophysical law. Schjelderup (141) discusses the theory of stimulation of the retina and from it deduces a new formula for the relation of sensation to stimulus, together with a corollary for the value of the DL. He then compares the values of the DL found by a number of investigators with those computed by his formula and finds very close agreement between the two series. The relationship is too complicated to be characterized by a single term such as 'logarithmic' or 'exponential.' It is purely algebraic (nontranscendental).

Dingler and Pauli (36, 116) find that logarithmic correlations occur in all sorts of bodily (plant and animal) and mental responses far more frequently than any other numerical relationship. These facts may be summarized in a general law of relativity, which applies the logarithmic relation of rapid rise at low intensities and slower increase at higher intensities to bodily and mental processes of

response to stimulus and of growth. The biological importance of this relativity is found in that it contributes to the conservation of life by permitting an advantageous state to be attained comparatively quickly, yet causing a harmful state to be reached but slowly. To find an explanation of the Weber-Fechner Law, the process of excitation must be considered as a unit. It can only be explained in terms of the coöperation of a large number of individual physico-chemical processes, such as the law of mass action and osmotic-electrolytic effects. Pikler (121) restates Weber's Law in terms of his adaptive theory of sensory processes, the details of which cannot be considered here.

Bourdon (20) discusses Fechner's formula for Weber's Law and tries to show that the distinction between stimulus and sensation is an error. Both are alike, one and the same thing. Pradines (123) holds that the interesting part of Weber's Law is not consciousness of difference, but the fact that changes are, for a time, unconscious. The law should be stated: "Our unconsciousness of intensity increases with the intensity." The facts of the law and the exceptions to it are partly to be explained by some kind of activity which consciousness exerts towards the increments of intensity. Mark (104) considers the general phenomenon of the limen and its meaning for psychology; the qualitative and quantitative DL's for sound; and the importance of these limens for hearing. He interprets the RL as purely physiological and the DL as in part physiological and in part psychological. Bonaventura (7) discusses the importance of psychophysics for various branches of psychology. He believes the criteria of judgment in psychophysical experiments have been chosen rationally rather than empirically. Pieron (120) describes the widespread application of the Weber-Fechner Law in various biological fields and shows some of the implications of this law for the biological sciences.

Effects of Special Conditions

The effect of attitude upon the psychophysical judgment has received particular attention. Boring (15, 16) discusses the so-called stimulus error. He first traces the development of the notion of a quantitative psychology and the objections raised thereto. The psychology of capacity attempted to meet these objections by abandoning mental magnitudes and measuring the capacity of the organism for response. The older psychophysics sought to protect itself against incursions of the physical attitude of the psychologists of capacity

by styling that attitude the stimulus error. The implication would be that a psychology of capacity should cultivate rather than avoid the stimulus error. " The thesis of this paper is, however, that recent researches have shown that the observational attitude which is directed upon the stimulus—the attitude of the stimulus error—may sometimes lead to equivocal correlations of stimulus and response which, because equivocal, are unscientific. In the case of the limen of dual impression on the skin, for example, a psychology of capacity must make use of introspective data if it is to attain its own ideals."

Friedlander (**53**), working upon the perception of weights placed on the skin, found that it was possible to take two attitudes toward the experience, an attitude of attention to the sensations and an attitude of attention to the lifted object. Determinations of the DL under the two attitudes showed the limen to be somewhat smaller under the object attitude than under the sensation attitude. In a second experiment performed by means of an esthesiometer an opposite result was obtained, but in this case the observer was unable to objectify the pressure and the instructions to do so acted as a distraction. Fernberger (**44**) used a similar method in an experimental study of the stimulus error in the case of lifted weights. He determined the DL under three sets of instructions: to report only upon the intensity of the pressure sensations in the fingers; to judge the intensity of the kinesthetic sensations set up in the wrist; and to judge the weights themselves. The psychometric functions and limens obtained vary between the different instructions. The pressure and kinesthetic instructions give rise to strictly psychological results, while the stimulus attitude leads to an equivocal sort of judgment which, because of its low degree of subjective assurance, tends to yield a large threshold. The author's final conclusion that " This experiment seems to show the futility of properly interpreting the statistical results of a purely behavioristic experiment " called forth discussion by Weiss (**161**) and a reply by Fernberger (**45**) which exhibit the wide differences between the attitudes of the introspectionist and the behaviorist toward a psychophysical experiment, both as to purpose and interpretation. Reid (**133**) practically repeated Fernberger's experiment, obtaining copious introspections from the observers under each set of instructions. He considers the thresholds and measures of precision obtained in the light of the introspective reports of criteria of judgment, reports which showed that in a majority of cases the instructions were contaminated or exceeded. The statistical data are treated qualitatively by being rearranged under the

the types of judgment the observer reported giving instead of under the types to which they should have belonged had the instructions been successful in producing the desired attitude. Of the three bases of judgment, the attitude of judging the weights as objects gives the most accurate results. It affords a more stable basis of judgment than does pressure pattern in the fingers; and this in turn a more stable basis than pressure pattern in the wrist. Garrison (55) reports a companion study of differential thresholds for extent of arm movement under two instructions; to judge objectively the distance through which the observer's arm moved; and to judge in terms of the pressure pattern these movements set up in the elbow. He finds that a change of instructions does not necessarily bring about a change of attitude in the observer. The limens are relatively larger under the object instruction than under the pattern instruction, but the difference tends to disappear with practice. There is little difference in the coefficient of precision.

Philippe (118) investigated the effect of the observer's knowledge of the stimulus upon the cutaneous perception in the two-point limen. A blindfolded observer neither perceives two discrete points nor is able to characterize the perception by reference to object. When he knows something about the stimulus, the observer describes intermediate patterns similar to those found by Friedline (54) and others. Travis (154) studied the effect of abstraction upon the intensive RL for tones. Determinations were made under normal conditions and when the observer was gazing into a crystal and recalling some pleasant experience as a starting point for revery. The results are equivocal, an increase in the threshold for four of the ten observers, a decrease for four of them, and no effect for the other two. Bates (3), in her study of the Müller-Lyer illusion, attempts to make objective measurements of attitudinal change. The variables are the brightness of the wings and the instructions to the observers. The effect of a shift of instructions upon the observer's attitude can be stated in terms of the variation in wing brightness necessary to bring about an equal change in the amount of the illusion.

Fernberger (40, 41) reports an experiment upon the DL for lifted weights in which the two middle pairs of stimuli (96 g. and 100 g.) followed either an 88 g. or 104 g. pair. He finds that, "There is present, in the method of constant stimuli as applied to lifted weights, a constant effect between the pairs of stimuli. If a comparison stimulus, which is likely to fall within the interval of uncertainty, immediately follows the lightest pair, for which, of

course, the judgment is usually 'lighter,' there is a strong tendency that it will be judged 'heavier.' If it follows the heaviest pair—which usually gives the judgment 'heavier'—there is an equal tendency that it will be judged 'lighter.' The presence of this factor of contrast causes a distortion of the curves for the psychometric functions. . . . It has a slight effect upon the size of the interval of uncertainty and a very marked effect upon the position of the thresholds and the point of subjective equality. There seems to be a slight tendency for this factor of contrast to increase with practice. It seems doubtful if simple instructions given the observer will eliminate this factor. . . . A method of eliminating the effects of the factor . . . by handling the objective relations of the stimuli themselves is suggested." Borak (8) shows that in the case of the DL for pressure (weight on forearm) there is a greater sensitivity to increase of weight than to decrease of weight. The limen is smaller in ascending than in descending series, but within such type of series it seems to follow Weber's Law. Central as well as peripheral factors are involved in these results, since change change in the weight is a stimulus to muscular action. Geissler (57) studied the effect of expectation on judgments of sound intensity and of visual extent. His results show that the variable is the more over- or under-estimated the more it differs from the expected stimulus, the tendencies to err being always in the direction of the expected standard. The tendency to error is larger when the standard to be expected is also previously given in perception than when it is merely imaginally anticipated. Tittel (153) investigated the effect upon the DL for successive fork tones of an inducing stimulus which preceded the standard. Assimilation occurs when the interval between the inducing and the standard stimuli is less than an octave and contrast when it is greater than an octave, with the exception that assimilation appears with all consonant intervals for musical observers. Tittel believes induction to be centrally conditioned.

Herrmann experimented upon the effect of a group, which formed an obscure background, on the successive comparison of horizontal lines. The tendency to form a mean idea of the group bore more heavily on the first than on the second stimulus shown. There were also tendencies to form means of subgroups. Gelb and Granit (58) determined the chromatic RL by means of a disc of colored light thrown upon a colorless figure (cross) or upon the ground of the figure (remainder of a larger disc). The results indicate that the color limen is higher for the figure than for the ground, and that

the difference is greater the more striking the difference between figure and ground. Incomplete experiments point to a smiilar dependence of the DL for brightness upon the figure-ground difference.

Bush and Austin (25) determined the DL for pressure on the hand and for tension from the wrist at three standards by allowing water to flow continuously into a beaker and having the observers report when the beaker felt heavier than it had been. With water flowing into the beaker at different rates, it was found that the limen is smallest for slow rates of increase, but that the time from the beginning of the increase of weight until the threshold is reached is least for the fastest rates of flow.

Chiba (27) studied the relation of differential sensitivity above and below the standard stimulus. Results of experiments upon the DL's for pitch and light intensity, as well as discriminative reactions to pressure intensities, indicate that discrimination is better above the standard than below it. This asymmetry is primarily a matter of relativity or contrast. Gertz (160) investigated the effect of adaptation upon the DL for temperature. The DL decreases the nearer the standard stimulus approaches the temperature to which the skin is adapted.

Putter (126) found that the intensity of stimulus necessary for liminal stimulation of the eye is an exponential function of the length of stimulus up to .5 sec. Fodor and Happisch (51) worked on the effect of the interval between stimuli upon the DL for the brightness of two flashes of light. When the stimuli are of the same intensity, the percentage of " brighter " judgments increases as the time interval is increased. The time interval at which the second is judged as brighter is inversely proportional to the intensity of the stimulus. Working with objectively equal stimuli by the constant method, they found the liminal time interval (schwellenzeit) at which 50 per cent of the judgments would be " brighter." In the case of the DL for taste (NaCl), they had found that increasing the time between the stimuli raised the limen, but that it increased the lower more than the upper DL.

Vision

Cobb and Loring (30) describe a method of measuring the threshold of retinal sensitivity in which a very small and fixed extent is exposed tachistoscopically for a measured length of time. The stimulus is physically a negative one since it appears as a black dot on a white screen. The limen, in terms of time of exposure

as conditioned upon area of stimulus, was determined by the method of serial groups, computed by linear interpolation. The time of liminal exposure multiplied by the area of the stimulus was approximately constant. Cobb (29) found this relation to hold for large as well as small stimuli, although there were individual variations in the sensitivity of his observers. He also describes (28) the use of these threshold measurements in routine examinations for air service. Reeves (132) reports experiments showing a greater sensitivity to brightness and brightness discrimination under dark adaptation for binocular than for monocular vision. Müller (108), however, finds opposite results, that the RL for dark adapted eyes is the same for both types of observation.

Hecht (78) studied the differential sensitivity to light of *Mya arenaria,* as indicated by retraction of its siphon in response to an increase in illumination. The relative DL shows the same course as for the human eye, a decrease up to a certain point and then an increase. From the chemical point of view, it is evident that for the retinal elements to discriminate between one intensity and the next perceptible one the transition from one to the other must involve the decomposition of a constant amount of photosensitive material. The magnitude of this increment is greater for the rods than for the cones. This fact results in a shift in the general course of the DL between rod and cone vision. Griffitts and Baumgartner (66) determined visual acuity by the observer's brightness discrimination in setting a Lummer-Brodhun photometer (approximately a method of average error). Visualization of the same observers was tested by the solution of geometrical puzzles. A small but positive correlation was found between these two characteristics. Bishop (5) describes an apparatus for the presentation in rapid succession of colored stimuli (painted surfaces) in determinations of visual DL's and RL's. The visual experiments of Putter (126) and Gelb and Granit (58) have already been considered.

Young (164) tested the chromatic thresholds for B, R, G and Y by making up solutions of dyes and dropping one drop on blotting paper. The observer was given a series of these papers and asked to name the color. Threshold values for normal and diseased persons are given in terms of strength of solution. Ferree and Rand (47) give measurements of the chromatic threshold, in terms of the intensity of light necessary to recognize the color, from the center to the periphery of the retina. No constant ratio between color pairs, as would be expected from the Hering theory, is found. The general

bearing of the results upon color theory is discussed. Dimmick (35) determined chromatic limens for R, G, B, Y, Bk and W, as differentiated from a middle gray, using colored papers. The limens were all of approximately the same magnitude. Dimmick uses this fact as evidence that the gray-black and gray-white sensory series are similar in nature to the sensory series from gray to a color. Haupt (76) used monochromatic spectral light to ascertain the chromatic RL at seven points on the spectrum and the number of j. n. d.'s between the lower and upper chromatic thresholds at each of the four primary colors. Liminal chromatic sensitivity increased in the order: O, R, Y, BG, B, YG and Y, with dark surroundings, and in the order: O, Y, R, YG, B, G and BG, with light surroundings. Elliott, West and Hoisington (37) determined the chromatic thresolds for film colors of the four principal hues. Film colors were produced by having the observer view the color through a small hole in a gray screen of the same brightness as the color to be observed. The size of the hole was kept constant and the relative size of the color varied by shifting the distance of the observer from the apparatus. The limen, in terms of visual angle, is about the same for R and G and for B and Y, the latter being nearly twice the former. Ginsberg and Hoisington (63) utilized a similar method to compare the relative saturations of a surface and a film color. The surface color was used as the standard and differential thresholds obtained for the film color in terms of visual angle.

Laurens and Hamilton (99) determined the DL for hue throughout the spectrum. The stimuli were pairs of spectral lights presented simultaneously. The number of visible hues (j. n. d.'s) was found to vary from 161 to 207. The threshold is smallest in Y and BG, with secondary minima in O, V and G. "There is a decided shift in the names applied to spectral wave-lengths due to successive induction, and thus depending upon which direction the spectrum is scaled. No such shift is observable in regions of minimum threshold." When colors are set so as to be just noticeably different they sometimes and at some wave-lengths appear more different from each other than they do at other times or at other wave-lengths. "This subjective fact bears no relation to the physical value of the threshold . . . but it casts doubt upon the value of the 'least perceptible difference' as a psychophysical unit." In a second paper, Hamilton and Laurens (73) determine similar discrimination curves after fatiguing the eye to R, G or B by 30 seconds' exposure (repeated for each observation) to homogeneous light. The curve

obtained for red-fatigue is essentially that of a protanope (red-blind), that for green-fatigue of a deuteranope (green-blind). Data were lacking for comparison with a tritanope (blue-blind). The authors consider that they produced artificial color-blindness by fatiguing the eye to these colors. Fatigue to OR, Y, BG and W had little effect and no selective action. The application of the results to color theory is discussed.

Troland (155) measured the differential threshold for brightness between all possible combinations of eight spectral colors (the so-called psychological primaries and their intermediates). The threshold increases to a maximum of from five to ten times that for zero color difference when the color difference is a maximum. The law connecting this relative increase with hue scale difference is the equation of the ellipse. Nagel (109) determined the brightness equivalence of red and gray. Within the limits of accuracy obtainable he found verification of Wirth's law of correspondence which declares that, if the equivalence value of one experiment is made the standard stimulus in a second series, then the second equivalence value will coincide with the original standard stimulus of the first experiment. The task of judging heterochromatic brightness equivalence requires observers trained to judge directly in terms of brightness as a relatively independent character. The task is not too difficult to admit of consistent results after practice. The papers of Harrison (75), Schjelderup (141) and Chaffee, Bovie and Hampson (26) have been reviewed above in connection with the discussions of Weber's Law.

Audition

A series of determinations of intensive RL's and DL's by physicists (largely from the laboratory of the American Telephone and Telegraph Co.) have appeared. While no standard psychophysical procedures were used in these studies and they are inadequate upon the side of psychological control of conditions, they are nevertheless of interest because of the apparatus used and the very accurate measurements of the physical intensity of the sound waves. With one exception (Lane) the source of the vibrations was a vacuum oscillator tube, whose frequency could be readily adjusted by varying the inductance and capacity of the actuating circuit. The intensity of the electric oscillations was controlled by some form of variable resistance, and the audible tone produced by either a telephone receiver or a thermophone. Kranz (95, 96) determined

the RL for sound at six frequencies separated by octave intervals. He found large individual variations, and suggests a scale for measuring auditory sensitivity in units of energy required for the threshold. A further report (97) describes a somewhat different procedure for measuring sensitivity of the ear. In this experiment, the apparatus was set at a given intensity and the frequency varied by the observer, who found the range or ranges of frequency within which he could hear the given intensity. This procedure was repeated with increasing intensities. The curves obtained, although they showed variations between individuals and between ears of the same person, tended to show three regions of maximum sensitivity. Minton (105, 106) investigated the RL of normal and abnormal ears. In middle ear deafness hearing is most deficient for low tones, while in inner ear deafness high tones are most affected. In true nerve deafness cases were studied in which a part of the tonal spectrum exhibited total deafness (tonal islands). Fletcher (48) measured the RL throughout the entire tonal range and found it to be low at the middle and high at the extremities of the scale. He also determined the RL for " feeling " the tones as pressures in the ears, which is practically the same as the RL for the tones as felt by the finger. Towards the extremes of the range, the threshold for " feeling " is lower than that for hearing. The upper and lower qualitative RL's are defined only by increase in the intensive RL at these points. A physical scale of sound intensities is suggested and applied to problems of telephonic communication and the measurement of deafness. Fletcher and Wegel (49) determined intensive DL's for normal and abnormal ears, using a very carefully controlled apparatus. Knudson (92) measured intensive DL's at eight different pitches and varying intensities with both pure and impure tones. His results follow the modification of the Weber-Fechner Law proposed by Nutting for visual sensations, with a " Fechner Ratio " (relative DL) of about 0.10. Guernsey (68, 69) used the same type of apparatus to determine the RL at a number of pitches and then the successive DL's up to an intensity as loud as an ordinary speaking voice. Weber's Law appeared to hold with a fraction of about 1/3 in the middle range of intensities and frequencies, and with a somewhat larger fraction for very high, very low and very weak tones. Lane (98) reports measurements of intensive RL's for frequencies between 2,000 vbs. and the upper limit of hearing. He used a Hewlett tone generator placed outdoors at night as a source of sound. The limen is practically constant from 2,000 to 14,000 vbs.,

and then increases to a point between 18,000 and 20,000 vbs., where the tone becomes inaudible. Wegel (**159**) discusses the bearing of the physical determinations of the sensitivity of the ear upon the diagnosis of deafness.

Weiss (**160**) obtained tones of variable intensity by means of electrically driven forks placed at varying distances in front of resonators. He obtained intensive DL's at six frequencies. A theoretical explanation of intensity judgments in behavioristic terms is appended. Kiefer (**86**) reports experiments with the gravity phonometer, both monaural and binaural. With low intensities the monaural and binaural DL's are approximately equal; with high intensities the binaural limen is the smaller. The binaural RL, however, is always lower than the monaural threshold. The ratio of stimulus intensities, binaural and monaural, which gives subjectively equal sound is 1:2.46 for weak, and 1:5.49 for strong tones. The work of Geissler (**57**) and Travis (**154**) has been mentioned in another connection.

Heck (**79**) describes a mechanical flicker phonometer for comparing sounds by rapidly alternating them and varying the sounds until the pulsations disappear. MacKenzie (**103**) used an adaptation of this phonometer in which the alternation is electrical instead of mechanical, the tones being produced by vacuum tube, variable resistance and telephone receiver. With this apparatus he determined the relative sensitivity of the ear to sounds of different frequencies by a method analogous to flicker photometry. If two tones alternate at a suitable rate, the stronger tone is heard plainly interrupted, accompanied by the weaker tone whose interruptions are not clearly distinguished. If the relative intensities of the two tones are varied, a point may be found at which the two tones are equally interrupted. This point is identical with a loudness balance. A logarithmic relation was found to hold between pairs of frequencies at various intensities, in that the equated physical intensities, each substituted in the formula (with respect to constants, etc.) for its frequency, gave equal quantities. In other words, the relative intensities for equation of different frequencies showed a logarithmic relation to the absolute intensity of the standard stimulus.

Gilliland and Jensen (**64**) compare tests of pitch discrimination by means of Seashore's phonograph record with tests by means of tuning forks on the same subjects. While the record is standardized for practical test purposes, it is not satisfactory for laboratory experi-

ments. The investigation by Tittel (153) of the pitch DL has been mentioned in the discussion of the effects of special conditions.

Gleidemeister (64) measured the upper limit of hearing of persons of varying ages. He found it to decrease from about 20,000 vbs. in childhood to 13,000 vbs. in the late forties. Pratt (124) describes the use of steel cylinders for determinations of the upper RL for tones. Möller (107) used these cylinders to investigate the effect of intensity upon the threshold. The cylinders were actuated by steel balls dropped upon them from known heights. Psychometric functions are given for both frequency and intensity as variables, and limens in terms of frequency calculated by interpolation. There are differences between observers, but for a given observer the qualitative psychometric functions for different intensities are similar, as are the intensive functions for different pitches. No simple statement of the effect of intensity upon the upper limit seemed to be possible. Fletcher (48), however, found a definite relation, that the intensive threshold increases continuously as the pitch increases.

Rich (136) used a psychophysical procedure to study the theoretical problem of tonal attributes. The observers were instructed to judge, in different series, the vocality, pitch, volume, brightness and tonality of pure tones, and differential limens with respect to frequency were obtained under each instruction in three tonal ranges. Using inseparability and independent variability, as shown both by thresholds and by introspective reports, as criteria, three separate attributes are distinguished: pitch-brightness, volume and tonality. They are independently variable in that (1) their limens occur in the ascending order: pitch-brightness, tonality, volume; and that (2) the threshold for pitch-brightness decreases toward the center of the scale and increases beyond it, the limen for tonality increases steadily without following Weber's Law, and the threshold for volume follows Weber's Law. Halverson (70) found that the volume of a tone varies according to the relative phase of the tone at the two ears and measured the threshold for this variation. The volume is greatest when the phase-difference is zero or one-half the wave-length, and least when it is three-sixteenths of the wave-length, with three liminal steps between maximum and minimum. Halverson (71) also obtained differential limens for the volume of tones of constant pitch (from vacuum oscillator tube) as conditioned upon variations of the physical intensity of the sound. The volume of the tone varies in the same direction as the intensity, but the two are independently variable since the volumic limen is much larger than

the intensive limen. They may, therefore, be considered separate attributes. Weber's Law appears to hold for volume as a function of sound intensity as well as for volume as a function of frequency.

Pratt (125) studied the bisection of tonal intervals smaller than the octave by the method of equal sense distances, with procedure by the constant method. The point of subjective equality tends to fall near the geometrical mean. Owing to the equivocality of the judgments made on these intervals, it is not possible to give any adequate interpretation of the logarithmic relation which seems to hold between the stimulus and the mental process.

Taste

In the field of taste, psychophysical procedures have been used to obtain equivalent tastes, both liminal and supraliminal, in various attempts to investigate the chemical factors underlying the phenomena of sapidity. Gibson and Hartman (61) determined the RL's for three acids, using the constant method and Brown's procedure for application of the stimuli. The limens occur in the order of relative ionization, but are not proportional to it. Ostwald and Kuhn (112) report RL's for twelve acids obtained by Bohnen (6). They find that the taste of an acid varies inversely as its power to produce swelling of colloids, and give physico-chemical formulae for this characteristic. Paul (113, 114) measured the relative sapidity of supraliminal solutions of a number of acids by the method of equivalents with constant procedure. He finds that sapidity depends not only on H-ion concentration, but also on the capacity of the solution to yield its reserve of H-ions to the tongue and also to some extent on the nature of the anion and the vapor pressure of the acid. The sapid characteristic of an acid is called its molecular activity, and is given as a numerical value referred to the sapidity of HCl as a base. Pauli (117) used a similar experimental procedure to obtain the relative sapidity of sugar and saccharin. Renqvist (134) determined RL's for several homologous series of alcohols and esters. From a formula involving the diffusion coefficient, the adsorption exponent, the serial number of the compound and the liminal molar concentration for taste approximately constant values are obtained in homologous series. Komuro (93) measured the RL's for the four tastes at various temperatures. The limen decreases by about 50 per cent from 10° to 20° C. With further elevation of the temperature this effect is less marked, and the converse may even occur between 30° and 40°. Skramlik (143) produced tastes equivalent to those of

inorganic salts by mixtures of substances (NaCl, quinine, tartaric acid and glucose) and also determined several taste DL's. Fodor and Happisch (50) investigated the DL for solutions of NaCl and found that Putter's Law was a better statement of the results than Weber's Law.

Cutaneous and Kinaesthetic Sensations

Franz (52) determined the RL for pressure (stimulus-hair) on various regions of the body for normal and abnormal observers. He used a modification of the constant method, in which the value obtained was the percentage of responses for each intensity in a small area of constant size, and gives his results in the form of psychometric functions. Cerebral and some spinal hypaesthesias show increase in the thresholds for all parts of the skin, while other spinal and all peripheral diseases of the pressure sense show some regions in which the limen is normal or about normal, but even in them the stimulus required to obtain 100 per cent judgments is increased. Halpern (72) produced an artificial hyperaemia of the skin by means of either mercury vapor, mustard plaster, acetic acid or potassium hydroxide. The effect of the hyperaemia upon the threshold for stimulation by a hair is first a decrease in sensitivity, followed by an increase.

Hansen (74) determined DL's for intensity of pressure, working with stimuli of various extents from a point up. For point stimulation the relative DL is about 40 per cent, for larger areas it is only 10 to 20 per cent. It is largest of all when an isolated pressure spot is stimulated. He concludes that Weber's Law, in so far as it possesses any validity for pressure sensations, is conditioned by extensive rather than intensive changes of the stimulus. The experiments of Borak (8), Kiesow (87) and Gatti (56, 88) have been reviewed earlier in this paper.

Bush and Austin (25) measured DL's for pressure on the hand and for tension (lifting from the wrist) with continuously variable stimuli produced by allowing water to flow into a beaker. The results have already been mentioned in the section on the effects of special conditions. Ortmann (111) determined the DL for pressure on levers similar to piano keys and correlated the results with his observers' technical pianistic skill. The correlations obtained are positive but low, the more talented performers tending to have the smaller limens. Percussive touch yielded coarser discrimination than did nonpercussive touch. Larger thresholds were obtained when

the hand, forearm or arm moved than when the movement was of a finger only. Movements of the key both up and down gave the smallest limens, movements down only those next in magnitude, and movements up only the largest thresholds.

Putter (130) determined the DL for temperature. It was never less than 0.5° C. and was smallest in the region of 28°, rapidly increasing in either direction. Weber's Law was found not to hold for either warmth or cold, but a new law that the threshold is an exponential function of the stimulus. Gertz (60) investigated the effect of adaptation upon the DL for temperature and found that the limen is less the nearer the standard stimulus is to the temperature to which the skin is adapted.

Fernberger (42) describes a cylinder for use in lifted weight experiments which has the advantages of uniformity in size and in apparent temperature and of invariability under changes in humidity. The experiments of Friedlander (53), Fernberger (40, 41, 44) and Reid (133) involved the use of lifted weights, but these studies are concerned with the effects of particular conditions upon the psychophysical judgment and were considered in detail under that head.

Perception

Koruda (94) determined the least discriminable distance between two seen points (space threshold), and found it to be the same whether one or both eyes are used. Binnefeld (4) used both lines and distances between points to determine the DL for visual length. In the light, the average relative DL is 1/40. Working in the dark with distances between points, it is slightly higher. Tachistoscopic exposures were also used to rule out eye movements, with little effect. Herrmann (80) and Geissler (57) used the comparison of visual extents to study the effects of background and expectation, respectively, as already mentioned. Lips (101) compared two simultaneously presented vertical lines with a third line which appeared in between in the space just occupied by the first two, using the constant method. The double judgment gives a greater scatter than does the single judgment, but a smaller interval of uncertainty. This result is probably due to the stimulation afforded by a more complex task, yet one which can be attended to in a unitary way. Wolfe (163) studied the estimation of the middle of lines (strips of white paper). He used the method of average error, the observer making a pinhole at the apparent middle. The experimentation was both extensive (400 untrained observers) and intensive (2 trained observers). The aver-

age error was found to be about 1 per cent of the entire length, and to become reduced by practice. Weber's Law seemed to be valid within the range used (50–1,000 mm.).

Anderson and Weymouth (1) used white threads on a black surface to investigate DL of binocular perception of distance. With the threads 4 cm. apart and 2 m. from the observer, the limen was 70 mm. They attempt to explain the fact that the threshold is less than the diameter of a retinal element by a theory of retinal mean local sign. Bates (3) utilized a psychophysical procedure to study the Müller-Lyer illusion. The stimuli were lines or dots presented either successively or simultaneously, with and without wings of varying brightness and under varying instructions. The constant method was used and the results are presented both as psychometric functions and as calculated points of subjective equality. The numerical results indicate the possibility of objectively measuring attitudinal change. In this case, the effect of shift of instructions is statable in terms of the amount of change in wing-brightness necessary to change the illusion by the same amount.

De Miffonis (33) determined the average error of placing a light vertically under a second light. With the two lights separated by a visual angle of 0° 22′, the error of verticality is less than 1′. Tinker's (151) experiment in adjusting a line to a number of points, already mentioned, might be considered a study in space perception. Rubin (139) investigated the problem of straightness. Two lines must diverge 30″ to be seen apart, but lines to be seen as straight must not diverge more than 22″. Attitudes have a direct effect upon the limen for curvature as determined by the method of limits. In the constant method, these attitudes are replaced by tendencies to bend the line to right or left and by direction of attention. The constant method yields the smaller limens. Gellhorn (59) had his observers compare the separation of an aesthesiometer, placed on thumb and forefinger (blindfold) and separated in this position to a given distance, with the aesthesiometer set to a given distance and shown visually (method of equivalents). Rapidity of movement in separating the points on the skin turned out to be the important factor in this comparison of visual and cutaneous extents.

Stewart and Hovda (147) studied the effect of intensity upon localization of sounds by conducting sounds of equal phase but different intensities to the two ears. They found that the amount of angular displacement is proportional to the logarithm of the ratio of sound intensities, and considered this relation an extension of

Weber's Law. When Stewart (**145, 146**) later verified this law, he came to the conclusion that it is a new law rather than an extension of Weber's Law, because it is concerned with the recognition of differences in nervous response, while Weber's Law is a law of nervous response.

Goudge (**65**) explored 42 regions of the body for Weber's Illusion. In the quantitative experiments five positions were chosen on each region studied. The points of an aesthesiometer were then set at a standard separation for the first position and the equivalent separation at the second position determined. Starting with this magnitude, the equivalent separations at the other positions were found. These quantitative determinations by the method of equivalents were made on five parts of the body (only qualitative results being obtained from the other regions explored). Kincaid (**89**) obtained experimental data to show the paradoxical error of reporting a dual impression for a single-point stimulation of the skin (in experiments upon the limen of dual impression on the skin). Assuming that this error indicates two antagonistic dispositions, one to judge "two" as the separation increases, the other to judge "two" as the separation decreases, she attempted to express the psychometric function as a combination of two functions corresponding to the two dispositions. Friedline (**54**) worked with two-point stimuli separated by less than the threshold of dual impression and required her observers to differentiate between various degrees of separation. They either were able to distinguish between the various cutaneous patterns with a high degree of correctness or else failed completely to do so. When fatigue was present, it was not possible to maintain a constant attitude toward the different patterns. This fact explains the effect of fatigue upon the two-point limen as usually found. Fatigue does not change the real threshold, but the criterion of the observer changes from some pattern which is subliminal, but distinguishable from a single point, to the true two-point criterion. Boring (**19**) discusses the bearing of experiments on the two-point limen in areas recovering from nerve division upon Head's theory of cutaneous sensibility. Pieron (**119**) investigated the two-point threshold for temperature sensations. His method consisted of dropping two drops of water upon the skin from an aesthesiometer. He believed that he obtained in this way a temperature sensation free from pressure, although experimenters who tried the same method for the localization of a single temperature sensation found that it did not give the desired results. Thresholds were obtained for temperatures from

32° below skin temperature to 21° above it. The limen was smallest at the extremes and largest at skin temperature.

Hoisington (81) used psychophysical methods to study the perception of the length of lifted rods. While his main task was a qualitative analysis of the perception, he obtained psychometric functions for differences in apparent length as conditioned upon the length, weight and center of mass of the rod. Limens were not computed because the perceived length depended upon the ratio between two opposing pressures in the hand, but there was in the stimulus-object no directly comparable element or moment which could be utilized as a base for computation. Shults (142) extended the work of Hoisington to the perception of rods whipped vertically. Limens were computed from the raw data, but only in terms of arbitrary units not corresponding to physical units of the stimulus. Baker (2) made a similar study of horizontally whipped rods.

Pirig (122) investigated the relation between perception of position by the arm and by the eye. He determined the DL for position of the arm by means of the Störring kinematometer and found it to be 0.64°, while the DL for position of the eye, obtained by the fixation of points of light in a dark room, was found to be 0.27°. The study by Garrison (55) of the thresholds for arm movement has been dealt with in connection with the effect of attitude upon the psychophysical judgment.

Klemm (90) measured the binaural temporal limen, that is, the threshold for the temporal succession of two sounds led to separate ears, such that they shall be separately localized. For one observer a threshold as low as 0.01° was found.

Attention

Fernberger (43) examined the classical experiments upon the so-called range of attention and found that the concepts employed were neither clear nor exact. Sometimes 100 per cent of correct judgments was used as the measure of discrimination, while at other times this percentage was not reached experimentally. The available data suggested that the statistical limen would form a more reliable and more readily determined measure of the range of attention. In a preliminary experiment, sets of from 4 to 12 dots were exposed tachistoscopically and the percentage of correct responses determined. The psychometric functions obtained are presented together with the limens computed from them. The latter vary between 6 and 11 dots, according to the observer and the conditions of presentation. Intro-

spective reports indicate that the determination was one of range of visual apprehension rather than of range of attention. Oberly (110) continued this work in a more extensive study. On the basis of preliminary reports, three types of conscious situation were distinguished and the observers instructed to report in terms of them. The first type was an immediate report in which all sensory elements were equally clear, and the thresholds of correct response for reports of this type were called limens of range of attention. The second type of conscious pattern involved the grouping of elements on different levels of clearness. Thresholds for cognition included correct responses of either of these two types. The most complex method of response involved counting, with the use of some mediate process. Limens for visual apprehension were computed from the percentages of correct responses of all forms. In all cases, judgments lacking in certainty were eliminated. As is inherent in the method, the thresholds are greatest for apprehension and least for attention, with cognition intermediate. Practice tends to increase the value of the limen, especially for attention.

Bowman (21) used the method of limits to ascertain the illumination necessary to make a cross of given size equally clear, on tachistoscopic exposure, with a larger or smaller cross. Size as a determinant of attention was found to bear to intensity a ratio of from 3:1 to 4:1. Spatial position proved to be a major disturbing factor, the left-hand position having the attentional advantage. Dewey and Dallenbach (34) made similar observations, using spots of light instead of crosses and proceeding by the constant method instead of the method of limits, but obtained similar results. Dallenbach (31) followed up the factor of position. He used the constant method to determine the relative intensity of two lights in various spatial relationships to each other such as to give equal clearness. The left-hand position has the attentional advantage. Burke and Dallenbach (24) repeated this experiment with left-handed observers and found that for them the positions to the right instead of those to the left have the attentional advantage.

Association

Williams (162), working under the direction of Boring (9), attempted to apply psychophysical procedure to the measurement of association. The similarity of the problems of measurement in sensation and in memory suggests the determination of a "mnemometric function," comparable to the psychometric function, and the calcula-

tion of an associative limen as a measure of memory. The concept of a threshold is valuable in this connection, as a given reproductive tendency can only be determined to be either adequate or inadequate to reproduction, just as a given stimulus can either produce or fail to produce a sensation. Using an adaptation of the constant method, the percentages of correct response for five numbers of repetitions were obtained, all other factors being held constant. The " mnemometric functions " secured show inversions and do not directly fit the *phi-gamma* hypothesis. On the supposition that repetitions are progressively less effective and are, therefore, not mnemonic units, the values of the numbers of repetitions were expressed as logarithms, square-roots, cube-roots and hundredth-roots, and the *phi-gamma* hypothesis applied to the transformed functions. The logarithmic transformation gives the best approximation to the theoretical curve, as well as the smallest liminal values. The same mathematical procedure was applied to the data from a number of classical experiments in memory, with like results. Ernst, Smith, Moessner, Rudisill and Atwater (39) extended this type of study. They determined the strength of the associative tendency, as measured by the constant procedure applied to the method of right associates, for five numbers of repetitions with a constant rate of presentation and for five rates of presentation with a constant number of repetitions. The data are first presented in the form of " mnemometric functions." A number of mathematical hypotheses were then tried out as means of computing associative limens from the crude data, and the adequacy of each hypothesis tested by Thomson's criterion. It was found that, of the hypotheses tried, a combination of *phi-gamma* and square-root hypotheses was most adequate to the " mnemometric functions " for variable number of repetitions, and the *phi-gamma* hypothesis applied to time per unit read most adequate to the functions in which rate of presentation was the variable.

Other Applications

A few workers in the field of psychophysics have applied their results to practical situations, although but a start has been made in this direction. DeMiffonis (33) determined the average error of placing one light vertically below another, and applies the result to the task of a pilot following a channel by keeping two lights (one placed higher than the other) in a vertical line. From his figures for the average error, he calculates the necessary vertical separation of a

pair of lights as conditioned upon the distance of the lights from the boat and the width of the channel to be followed.

Hazelhoff and Wiersma (77) apply liminal determinations to the problem of right- and left-handedness. Their experiments with liminal faradization, with discrimination of light weights, and with the aesthesiometer show that, in right-handed persons, the left hand is the more sensitive, with opposite results for a single left-handed observer. The theory is suggested that the development of motor functions in the hand most used inhibits its sensitivity. In their measurement of conditions of attention already quoted, Burke and Dallenbach (24) find a difference in attentional preference between right- and left-handed observers.

On the side of clinical applications, Franz (52) found that the RL for pressure could be used in differentiating between types of hypaesthesias, as has already been mentioned. Minton (105, 106) observed that in middle ear deafness low tones are most affected, while in inner ear deafness the hearing is most deficient for high tones, and that in some forms of true nerve deafness tonal islands appear. Fletcher and Wegel (49) obtained sensitivity curves for abnormal ears. Fletcher (48) proposes a physical scale for the measurement of deafness in terms of the intensive RL. Wegel (159) discusses the value of determinations of the sensitivity of the ear for the diagnosis of deafness. Cobb (28) describes the use of threshold measurements in examinations for Air Service.

Three papers have appeared in which psychophysical principles are applied to reflexes. Engelking (38) determined the minimum brightness necessary to produce a pupillary reaction, using both photographic and entoptic methods of observation. Under dark adaptation, the threshold for a positive response is .025–.04 meter-candle, although the first intimation of a response same at only .001 meter-candle. These facts lead to the conclusion that a slight pupillary reaction is aroused by stimulation of the rods of the retina, but that the function depends mainly upon stimulation of the cones. Groethuysen (67) used the Hess pupilloscope to measure the pupillomotor DL for brightness, and found it to be identical with the optical DL. It is not influenced by diseases of the retina, optic nerve, etc. Radovici and Fischgold (131) recorded the reflex contractions caused by induced shocks applied at varying rates to the skin in cases of paraplegia. The rate of response varied with the rate of stimulation and the relation between these two variables was similar to Weber's relation between excitation and sensation.

Lyon (102) contributes a pharmacological application. He measured the effects of various amounts of adrenalin (intravenous injection in cats) upon blood pressure. The relation of the pressor effect to the amount of adrenalin administered follows the Weber-Fechner Law, and Lyon was able to work out the constants of Fechner's formula for this reaction.

Kelley (84, p. 329) suggests the use of psychophysical methods in the educational field and gives an example of how the constant process may be used in ranking English compositions on a scale of merit.

Kniep (91) discusses the psychophysical analogies that may be found in botany. He shows that a number of psychophysical concepts and laws are valid in the case of plants. Some of these are the concept of the RL as applied to tropisms and other phenomena of stimulation, the hyperbolic law of the relation of intensity of stimulation to length of stimulation such that the product is constant, Talbot's Law and the Weber-Fechner Law, which was first shown to be applicable in the botanical field in the case of bacteria. Stark (144) investigated the differential sensitivity of plants, including bacteria, using a number of methods of procedure. The thresholds are very large as compared with those of psychophysics. Thus, the DL for chemotaxis ranges from 0.03 to 400 times the standard stimulus, and that for contact stimulation from 2 to 3 times the standard. Weber's Law holds for chemotropisms, haptotropisms, chemotaxis, and to some extent for geotropisms. It can not be proven in the case of phototaxis. Rippel (138) found that the Weber-Fechner law holds for the responses of plants to various chemicals. He suggests that it is a general law of response, widely applicable in the organic world.

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PROCEEDINGS OF THE TWENTIETH ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY, CHAPEL HILL, N. C., APRIL 13 AND 14, 1925.

REPORT OF THE SECRETARY-TREASURER, J. A. HIGHSMITH, NORTH CAROLINA COLLEGE FOR WOMEN, GREENSBORO, N. C.

Meeting of the Council of the Southern Society for Philosophy and Psychology in Phillips Hall, April 13, 5 P.M. Present: J. F. Dashiell, President; A. S. Edwards, Buford Johnson, Herbert Sanborn, J. B. Miner, and Knight Dunlap (acting Secretary in the absence of Mr. Hughes).

The following recommendations to the Society were made:

(1) For officers for the year 1925–26: President, J. B. Miner; Vice-President, Josiah Morse; Secretary-Treasurer, J. A. Highsmith (3 years); Members of the Council, A. S. Edwards, J. F. Dashiell, and W. O. Furry.

(2) That the invitation for the Society to meet at the University of Kentucky next year be accepted; and that the invitation from the University of Georgia for the year following be accepted.

(3) That the meetings of the Society be held on Friday and Saturday before Easter, subject to change by the Council in case the need for change arise.

(4) That seventeen nominations for membership be approved and ordered reported to the business meeting of the Society.

Business Meeting, 9 A.M., April 14, President Dashiell in chair.

(1) On nomination by the Council the following officers elected for the next year: President, J. B. Miner; Vice-President, Josiah Morse; Secretary-Treasurer, J. A. Highsmith (for 3 years); Members of the Council, A. S. Edwards, J. F. Dashiell, and W. O. Furry.

(2) Seventeen nominations for membership were made by the Council and were elected by the Society to membership.

(3) The recommendation of the Council that the invitations for the Society to meet at the University of Kentucky in 1926, and at the University of Georgia in 1927, was approved.

(4) The proposal to change the time of meeting to Friday and Saturday before Easter was approved, subject to action by the Council.

(5) Dr. Dunlap offered a resolution proposing an amendment to the Constitution of the Society abolishing the office of Vice-President. The resolution was adopted, the final vote to be taken in the session of 1926.

(6) A resolution was proposed by Dr. Miner extending the thanks of the Society to the University of North Carolina for the cordial hospitality shown to the Society and was unanimously adopted by the Society.

ABSTRACTS OF PAPERS

Investigation of Child Welfare in the Institute of Social Research at the University of North Carolina. A. M. JORDAN, University of North Carolina.

The Department of Educational Psychology of the University of North Carolina participates in the recent gift of the Laura Spelman Rockefeller Foundation to the extent of one assistant and ample funds for the carrying out of any reasonable research problems. The problem chosen is concerned with the consecutive mental measurement of children whose parents work in cotton mills. Standardized group tests are being used with the intent of checking up on any unusual cases with the Stanford-Binet. The work is to last over a period of three years and some emphasis will be placed upon physical as well as mental growth.

The Function of Philosophy in Liberal Education. HERBERT SANBORN, Vanderbilt University.

As a natural result of our pioneer environment and traditional orientation we have come in America to make a fetich of *abstract* practicality to an extent that is provincial in comparison with other civilized countries. However justifiable this may seem to have been in the past, it is evident that we have now arrived at a period of world-development, when this attitude is or soon will be detrimental in the highest degree. Under the influence of this national obsession, we have passed from a personalistic, aesthetic, concrete sort of education to one which overstresses work in impersonalistic, abstract subjects. In providing for justifiable differentiation in education we are overlooking the equally important function of integration and are not furnishing adequate education for leadership in political and social life. Liberal leadership doubtless rests on liberal education that frees the individual from bondage and prejudices of various

kinds, developing in him the capacity for putting himself in the place of opponents and of appreciating things from more than one point of view. Such development, however, is hardly possible under a system which allows the average student only one ultimate point of view—that of atheistic naturalism, based upon a probably fallacious interpretation of scientific results.

Under the domination of his environment and traditional orientation the election of the immature student can hardly be said to be free; and while as a matter of mere theory all subjects are doubtless equally liberal, in actual practise some of them tend more readily than others to become *abstractly* vocational in spirit. If academic freedom means the right to pursue and to communicate the concrete truth, then the present compartmental curriculum, under the influences referred to, amounts to an infringement of academic freedom; its aim is not truth in its integrity; so that even when threatened with the disaster of unenlightened political restriction it has greatly weakened its defense based on its natural claim to academic freedom. This is probably the situation whenever a scientist passes beyond the field in which he is competent into the philosophic field, and is teaching atheistic naturalism.

The importance of historical, philosophical, humanistic education has become clearer through the realization (based on the epoch-making work of Groce and Rickert) of the nature of history and of its intimate relationship or identity with philosophy. Science needs to be humanized, not in the sense that it shall be merely popularized "in pulpit and magazine science", but in the sense that its function in truly *intelligible,* human life shall be evident. The function of philosophy should be the accomplishment of a unification of the college curriculum, and this subject should be prescribed for every candidate for a bachelor's degree.

The organization of the liberal arts curriculum should center about the social sciences; and these should be oriented, not merely with respect to an abstract sociology, but chiefly with respect to a social philosophy, even international in scope. For the purpose of such humanistic organization, which will demand a first-hand acquaintance with foreign languages and literature, some curtailment of English and history courses would seem to be indicated—novel reading, sectional and national literature and history—it being, from the point of view of education, more important for a student to be familiar with the great epochs of history and the masterpieces of the world's literature. Thus time might be saved for more serious

work in both science and humanism that needs the direction of an instructor. Specialization should be relegated largely to institutions especially fitted for such work, but even in such institutions provision should be made for a philosophical orientation for all scientific and humanistic students; since leadership, even in special fields, is conditioned by a broader view than is provided for by training adequate for mere coöperation in special investigations.

Controlled Word Associations to Verbs and Adverbs. KNIGHT DUNLAP and A. L. FINESINGER, Johns Hopkins University.

A new method of studying controlled word associations has been developed and applied to number adding and number subtracting, to adjective-noun and noun-adjective reactions, and to adverb-verb and verb-adverb reactions. The significant result is that the adverb-verb reaction is shorter, in general, than the verb-adverb reaction, in spite of the more usual order of speech being verb-adverb. Doubt is thereby thrown on Loring's explanation of the shorter adjective-noun reaction, as compared with the noun-adjective reaction as due to the normal adjective-noun order of English speech.

Psychological Problems of Population. KNIGHT DUNLAP, Johns Hopkins University.

The important psychological problems of population include the following: (1) The problem of race psychology, as yet a merely theoretical subject. The prospect of obtaining psychological data concerning racial differences is dubious, and is distinctly negative as regards savage races. (2) The problem of eugenics. Eugenic possibilities are practically limited to the negative program, for which contraception alone offers a possible means. (3) The problem of overpopulation. This is essentially connected with the problem of war, which is one of the most pressing of present psychological problems.

The Effects of Suggestion and Tobacco Smoking on Pulse Rate and Blood Pressure. ROY M. DORCAS, Johns Hopkins University.

The problem under investigation is whether the rise in blood pressure and pulse rate which accompanies cigarette smoking is due primarily to physiological causes or whether it is due to psychological causes. The method of attack differed from the usual methods in that hypnosis was employed in conjunction with other "control" measures for deceiving the reactors. The conclusions were that the

increase in blood pressure and pulse rate which is produced by smoking is caused by physiological conditions rather than by psychical conditions. Another interesting finding was that there is an increase in the intensity of the heart beat when tobacco is smoked.

Limits of Trial and Error Learning. JOSEPH PETERSON, George Peabody College.

The kind of learning that we call trial and error seems to be that which has so-called useless or random movements, or "errors". These errors become gradually eliminated as learning progresses. It has been suggested that learning may be nothing more than the dropping off or elimination of these "superfluous" movements. Some writers seem to regard learning which does not display such useless movements as qualitatively different from learning by trial and error. The present experiment was devised to study the alleged difference between such forms of learning. The letters of the alphabet arranged in a key in their regular order were numbered in a random order from 11 to 36, so that the position of any given number had to be learned. E, by means of an electric key and time marker, was able to indicate on a kymograph record over a one-fifth second's scale simultaneously made by a Jacquet chronometer, the instant when he called out any number and also the time relatively of S's response with the corresponding letter. S was permitted to keep the key before him, and was asked to respond to successive numbers with their respective letters as quickly as possible; but he was told not to respond in any case until he had definitely located the letter of the number given. An error was then defined as a failure to make response within a predetermined period of time, as two seconds or one and one-half seconds. The error curve of learning thus obtained did not differ significantly from the usual error curve found in learning experiments. But is is interesting to note that when the errors had been eliminated for any one of the chance orders of the stimulus series, a more rigid criterion (*i.e.*, the use of a more restricted time period) again revealed them. Observation of S's responses showed frequent eye movements and irregularities in responses, and S's verbal report revealed corresponding "inner" or implicit "superfluous" processes, which did not differ in essential details from explicit trial and error movements. These were found to persist, but to become more and more refined in their nature and harder to detect, as the learning became more and more advanced; but finer and more rigid criteria revealed them as long as learning

continued. It may be doubted whether any learning will not be found by sufficiently delicate methods to consist essentially of the trial and error form. The idea of gradual perfection through invariable repetition of acts may have little real foundation.

A Group Color-Blind Test and Some Results. JOSEPH PETERSON, George Peabody College.

A short demonstration of a group test taking but fifteen or twenty minutes and the indication of some desired changes in it. The test is nonlinguistic and does not depend on the subject's knowledge of colors. Its possibilities of exhibiting the reactions of color-blind individuals are illustrated.

The Space Order Reaction of Young Children. SCHACHNE ISAACS, Johns Hopkins University.

Two sets of sixteen colored pictures, of varying degrees of interest, familiarity, and attractiveness, were mounted in rows of four on charts, 20 x 20 inches, ruled off in 5-inch squares. These were presented to the child who was given a yard stick and asked to point to and name as quickly as he could all the pictures on the chart. The examiner recorded on a prepared form the order of naming, noting repetitions and omissions. Fifty kindergarten children, and 21 pupils in Grade 1-B who had had some months of blackboard reading, were given the test. A second test was given to other similar groups, and to a group of 18 pupils in Grade 1-A, in which the child was asked to put a check in each circle of a set of 16 half-inch circles, ½-inch apart, in rows of four. A similar record of order of checking, repetitions and omissions, was made.

The most effective response to these requirements, for speed and the avoidance of repetitions and omissions, is, of course, to begin in one of the four corners and name or check across rows or up and down columns. A number of adults tested, gave, without exception, the reading order of response. The question arises, at what age does an "orderly" response appear, and what is its relation to the reading habit of beginning in the upper left hand corner and moving from left to right in the lines and right to left from line to line?

Of the 50 kindergarten children, in the first set of pictures, 6 gave an orderly response, and of these, 5 the reading order; in the second set, 18 gave an orderly response, and of these, 12 the reading order. Of the 21 Grade 1-B pupils, in the first set of pictures, 9 gave an orderly response, and of these, 8 the reading response;

in the second set, 12 gave an orderly response, all of them in the reading order. In the checking test, of the 49 kindergarten children, 13 gave an orderly response, of these, 6 the reading response; of the 28 Grade 1-B pupils, 18 gave an orderly response, of these, 12 the reading response; of the 18 Grade 1-A pupils, 13 gave an orderly response, of these, 11 the reading response. The indications are that the systematic space order reaction is determined by training in reading.

Blonde and Brunette Characteristics. A Study in Character Analysis. JOHN E. WINTER.

Popular books on business efficiency usually lay claim to a sound psychological foundation. Character analysis as an essential to successful business relations assumes an important place among the topics discussed, and authors generally resort to some modified form of phrenology or physiognomy for a psychological foundation. Among the criteria for the determination of character is that of color of skin, hair and eyes.

Blackford and Newcomb in their book "The Job, the Man and the Boss" lay down the rigid principle that the more an individual approaches a pure blonde or pure brunette the more will he manifest certain definite traits of character. To test the validity of these statements the following experiment was undertaken.

Twenty-nine judges were chosen, nine of whom were women. Each judge chose two blondes and two brunettes from among his intimate acquaintances, making a total of one hundred and sixteen subjects. The judges were given lists of blonde and brunette characteristics arranged promiscuously so as to avoid any suggestion as to what particular traits were supposed to belong to blondes or brunettes. Each subject received a positive or negative mark opposite each trait, indicating the presence or absence of that particular trait in his character.

The results were plotted in a series of graphs, and various correlations were worked out. It was found that in general a high percentage of blondes possessing blonde traits was accompanied by a comparatively high percentage of brunettes possessing the same trait. This held good for the brunette traits also. The results of the experiment were thus decidedly at variance with the theory of Blackford and Newcomb.

The conclusions arrived at were as follows:

1. The experiment reveals no plausible ground for Blackford

and Newcomb's theory of the relation between color and character traits.

2. Sex differences among the subjects play a larger rôle than color differences in the determining of character traits.

3. Sex differences among the judges appeared in the particular traits stressed.

The Effect of Music Upon the Ability to Coördinate. E. W. Atkins, University of North Carolina.

This report deals with a study of the coördination scores of 60 students. These students were given the Dunlap form of the Johns Hopkins Coördination Test twice—once while they were keeping time to late dance records and about three months later when the same records had become very familiar to them. In addition a comparison was made with a metronome operated at the same rate as the music. The scores on the Coördination Test with music were somewhat better than those without the music, but this difference seems to disappear with increasing familiarity of the music.

Intelligence Tests and Scholastic Ratings. A. S. Edwards, University of Georgia.

On his return from the army in 1919 the writer tested all students of the University of Georgia who reported for the examination and since that time has studied the scholastic ratings of these students. Both sets of records, Alpha and scholastic were had for 432 students. For all students the Pearson coefficient was .352, P. E. .0283. The highest correlation was for Freshmen, 169 cases, namely, .456, P. E. .0408. The median Alpha standing for all students was 123.3; the median scholastic standing according to the registrar's books 76.9. A student rating A or B on the Alpha examination may rate from A to failure in scholastic standing; a student who rates C plus or C on Alpha cannot expect to get a scholastic rating of A, but here prediction halts, for he may get any other scholastc standing. Another study was made in connection with the city school children, the Haggerty Delta 2 being used for grades 3 through 7; and the Otis Advanced test being used for the High School students. Here we combined the teachers' judgments with the results of the psychological examinations and thus made predictions which during the following five years have proved to be of a very high degree of accuracy and of administrative value. From these studies it may be said that the intelligence test was of practically no predictive

value for individuals, although it gave valuable supplementary information, and that the intelligence test plus teacher's judgments gave information of very high administrative value.

Significance of Intelligence Tests of College Students. BUFORD JOHNSON, Johns Hopkins University.

Intelligence tests have not been used in many colleges as an entrance requirement, but have been widely used for the prediction of success in college work as an aid in elimination and guidance of students. The primary method of evaluation of the tests has been the correlation of the scores with college grades. The coefficients of correlation obtained have varied widely even for the same form of intelligence test and no high coefficient has been reported. Assuming that success in college work is determined by past educational training, personality traits, and mental capacity, the question is asked if a high coefficient of correlation between intelligence tests and college grades is desirable. To what extent each of the three factors mentioned conditions the results of the intelligence tests is not known. The validity of college grades as measures of college work is not established.

There is need of analysis of individual responses to items in sub-tests forming the battery used as an intelligence test toward the end of constructing batteries of tests more reliable for differentiating the abilities of college students. Means of measuring the educational achievements in High School should also be obtained. These measurements should be combined with a psychological analysis of the problems and activities of the individual student.

A Method for Evaluating an Interest Psychograph for Vocational Guidance. J. B. MINER, University of Kentucky.

A method for evaluating records of interests was developed and illustrated in connection with the writer's paired interest contrasts used on his blank for the analysis of work interests. The method involves the comparison of groups in different occupations with a random group. Pseudo-professional groups among college freshmen at the University of Kentucky aiming at engineering, law, medicine and teaching were used for illustration. After stating the value of each check mark in sigma for the random group on the assumption of normal distribution of the interest, the value of the same mark in each professional group is determined by the percentage departing from the common choice. This permits the record of a

person to be rated for each profession and the totals compared. When the results of the method were tested for 20 students in each vocational group, the success of the method was at least three out of a possible four times what chance would give. At least 65 per cent were properly placed. To these should be added those who were working toward a profession which might be less satisfying because their interests were more in line with those in another group. The method would be useful for evaluating any profile of traits in relation to typical groups when the degrees of a trait cannot be scored in small units.

Organization and Work of the Bureau of Mental Hygiene of the North Carolina State Board of Charities and Public Welfare. H. W. CRANE, University of North Carolina.

SPECIAL REVIEWS

HERRING, J. P., *Herring Revision of the Binet-Simon Tests, and Verbal and Abstract Elements in Intelligence Examinations.* Yonkers: World Book Co., 1924. Pp. 71.

The first part of this little book contains the data on the derivation and validity of the Herring Revision of the Binet-Simon tests. Some of this material has appeared in the *Journal of Educational Psychology,* March, 1924. As one of the purposes of Dr. Herring's investigation was to build a new series of individual intelligence tests which assume our present criteria and correlate with them as highly as possible, the standard of reliability is the correlation with the Stanford-Binet test. This is, under favorable conditions, as high as $+.9908 \pm .001$ with a probable error of estimate of 2.37 points in I. Q.

In the second part of the book Dr. Herring examines the objections made to the Stanford and similar series purporting to measure general intelligence, namely that they are composed too exclusively of verbal and nonconcrete matter. The statistical procedure consisted of setting up on the one hand a "weighted composite criterion" of intelligence composed of the following:

	Weights
1. Stanford Binet	3
2. Educational age	3
3. Relation between CA and the grade reached at the time of the study	3
4. National Intelligence Test	2
5. Teachers' estimates of intelligence	1
6. Thorndike paragraph reading examination Alpha 2	2
7. Kelley-Trabue Completion Alpha	1

On the other hand were two scales, one (C) ranging from very concrete to very abstract, the other (N) ranging from very nonverbal to very verbal. The units for these scales C and N were selected from the following tests:

Dearborn Group Intelligence Examinations
Army Beta Examination
Indiana Mental Survey Primer Scale
Indiana Cross-out Tests
Thorndike Visual Vocabulary

The units were classified as belonging to either C or N by five competent judges. On the whole the correlations with intelligence, as defined by the criterion set up, were higher for abstract than for concrete tests, and higher for verbal than for nonverbal tests. Whether one accepts the resulting interpretation for pure psychology and for society at large depends upon the reliance one places upon their *a priori* plausibility and upon the assumed "weighted composite criterion" of intelligence.

LORLE I. STECHER

State University of Iowa

MACPHAIL, A. H., *The Intelligence of College Students,* Baltimore: 1924, Warwick and York. Pp. viii + 176.

The increased demand for admission into existing colleges with limited equipment has in many institutions called for a restriction of the number of students admitted. Restriction in numbers has brought with it the need of selecting from prospective applicants those best fitted by nature and training for what the college has to offer.

The first part of "Intelligence of College Students" is devoted to a survey of current practices in methods of admission to colleges and universities with special reference to the use of intelligence examinations, which have assumed a very prominent place in connection with college entrance. From numerous thorough investigations made to determine objectively the relative value of the various college entrance criteria, the order of validity from the most valid to the least valid seems to be (1) intelligence examination, (2) high school record (certification), (3) comprehensive examination, and (4) content examination (old type). Although the intelligence examination appears to be the best *single* criterion for admission, it is not sufficiently accurate to be used as the *sole* criterion. Coupled with others, particularly with high school record (certification), it affords a far better set of prognostic criteria than has heretofore been available.

Intelligence examinations have been used with satisfactory

results in many colleges not only in the selection, but also in the classification of students for the purposes of instruction; in making decisions on whether or not a student who asks permission to carry more than the usual amount of work should be permitted to do so; in choosing scholarship men; in probations; in determining the causes of failure; in dismissals from college, and in recommending students for positions. The author aptly points out that the institution that concentrates its energies to a superlative degree on its selection of freshmen and stops there, can claim for itself but little of the glory achieved by those admitted and graduated. It is also its function to keep a student in college once he is admitted; to help him make the most of himself and his opportunities while he is in college; to aid him in the choice of a profession after graduation. Those are the aims of the guidance movement. The educational guidance program so far as it concerns higher education should have its beginning in the high school, in guiding into college individuals of merit and away from college into other pursuits those whose incapacity is sufficiently obvious, and should find its culmination in the scientific application of the criteria discussed above, particularly intelligence examinations, in the study and treatment of the individual college student.

In Part II of the book is presented a very complete and careful analysis of the various criteria of admission and retention at Brown University. The relation of psychological tests to academic achievement, to separations from college, to the achievement of academic honors, and to the pledging and membership in fraternities are subject to detailed examination and interpretation. In addition the principal's estimates and rank in high school are examined with reference to the selection of freshmen in Brown University and their academic achievement. In a chapter devoted to criteria for the retention and dismissal of freshmen the value of psychological tests and academic grades is discussed. A section is also devoted to the adaptative and predictive value of general academic averages and of grades in specific subjects of the curriculum.

The conclusions drawn from this careful analysis can be briefly, and perhaps inadequately, summarized as follows: Psychological tests have been found to possess practical value as administrative aids at Brown University. They constitute one of the best available means for determining scholastic ability. *On the basis of what students have done in the past* it is possible to state quite definitely what kind of academic work one has a right to expect on the average from a student who makes any given psychological score. Students

with low academic grades are in general those with low psychological scores, and *vice versa*. Men receiving low psychological scores are shown to have practically no chance whatever of obtaining academic honors. The high school principal's estimate of a student is of little value in indicating what a student will do at college. A student's rank in high school at graduation is of greater predictive value, but it is not as reliable an index as the score in the Brown or Thorndike tests.

Coupled with poor academic work at the end of the first semester, a low psychological score is a just criterion for dismissing a man from college at that time. Of great interest is also the conclusion that a student's general academic grade at the end of his first semester is a very accurate index of what he will do during the second, and similarly there is a clear agreement between academic average for the freshman and sophomore year, although the grades received in a specific subject during the first semester vary pronouncedly in their prognostic value in respect to both high and low grades.

The general problems for the college are *selection* and *conservation*. More careful selection together with more effective guidance and supervision has already made notable progress at Brown University. Its work shows that there is no single test or criterion that can accurately estimate a candidate's fitness to do the academic work required at college and the desirability of retaining him at college. Many kinds of information must be obtained. Each kind must not, however, be given the same weight. The weight to be given can only be determined by a careful investigation such as the present one.

The second part of this volume represents one of the most important contributions which has been made in the field of selection and guidance of college students. Its value lies in the painstaking statistical analysis of a set of data and the well balanced interpretation of this data in the light of conditions existing in a given university. In spite of his very evident interest in the intelligence examination, the author weighs and interprets impartially the results of the statistical analysis of the validity of the more usual criteria. The same impartiality of judgment is not so evident in the first part of the book. Here the author tends both in content and interpretation to slight the cases which throw discredit upon the value of the intelligence test. It is true that in Table I (page 29) are presented a number of cases of low correlation between tests and academic standing, but this is followed by a long explanation of why a low correlation may have no significance. It is in the implication in this respect and in others, more

than in the fact of the treatment, that this tendency is revealed. The author also shows an occasional weakness in theory (as contrasted with technique), as for example, when he states that (page 28) "before casting aside such correlations as being too low to be significant we must bear in mind that these have been computed between intelligence scores and intelligence grades and not between two sets of intelligence tests nor between two sets of academic grades. In the two latter instances, one would be justified in expecting much higher correlations," and again when he quotes Miller as aptly pointing out that (page 32) "the more precisely a test measures intelligence the less will it correlate with academic standing" while he blithely devotes the rest of the book to the defense of the "intelligence" test as an indicator of academic standing.

The book closes with a bibliography of 294 titles of intelligence of college students.

MORRIS S. VITELES

University of Pennsylvania

PLATT, CHARLES. *The Psychology of the Social Life.* N. Y.: Dodd, Mead, 1922. Pp. 284.

WEEKS, ARLAND D. *The Control of the Social Mind.* N. Y.: Appleton, 1923. Pp. xviii+263.

These two books represent attempts to popularize social psychology. The first is written by a physician who also has a Ph.D. degree. He gives his book the subtitle "A Materialistic Study with an Idealistic Conclusion." Very few professional psychologists or sociologists would regard the book as especially materialistic, either in its beginning or in its conclusion. The author tells us that society is "a derivative from man's psychic need," and he rightly says that "society and the individual present but two sides of the same problem." The materialistic element in the book, if there be one, appears in the acceptance of the doctrine that instincts are "independent of all mental quality"; and the author starts the social life of man, rightly enough, with the human instincts. His doctrine of instinct is, however, very uncritical. Apparently he is not disturbed by the wordy war which has been going on over this psychological category for the last decade. He accepts the gregarious tendency as the source of man's social life, supplemented, of course, by the instincts of sex, fear, and combat. Habit, imitation, custom, tradition, and convention also play large rôles in human society, and

the same is true of sympathy, suggestion, hysteria, superstition, and error. The first part of the book is taken up with the discussion of these psychological factors, and the second part with applications and conclusions to the theory of society and to the problems of modern civilization. The problem of modern civilization, the author thinks, is due to the fact that man as an individual grows only through slow evolutionary changes, while society is saltatory in its movements. Hence, there is little wonder that man is not well adjusted to the society he himself has produced.

There is little new in Dr. Platt's book. Both its psychology and its sociology are rather thin, and in both subjects it is impossible to decide clearly which school he has followed. In the main, he seems to have followed James and McDougall in psychology, and Ross in sociology.

It can hardly be said that Professor Weeks, who holds the position of dean of the School of Education of the North Dakota Agricultural College, is any more successful in his attempt at the popularization of social psychology. He gives his book the subtitle, "Psychology of Economic and Political Relations," but the psychology again is inadequate. The author does not even tell us what he means by the "social mind." This is perhaps wise, because any attempt at definition of such a term might lead into difficulties, and detract from the popular presentation. Like the author of the first book, Professor Weeks also accepts uncritically some current biological views of human nature. He tells us, "we share in the inheritance of the prehistoric mind—the mind of the cave man, and the raw-meat eater, the hairy man." Nevertheless, he says, "In the sense that instinct is attributed to animals, man is almost without instincts." He holds very rightly that "learning is the greatest human fact." With this point of view he dilates upon the social significance of habit, the psychology of defense, the basis of coöperation, and the psychology of public business. In the second part of the book, he discusses more concretely the problem of social control. As would be expected from his point of view, he finds in education the chief agency of control. "Education is the most fundamental government." But the concrete conditions of life must also be controlled if we would control properly the social mind. "The large problem of society," says the author, "is to provide joyous outlet for inherited tendencies, and constructively to redirect such expressions of instinct as are not in harmony with rational program." All of this is, of course, wholesome, but it scarcely penetrates beneath the

crust of our social order to the real problems which lie underneath. Both of these books will have a wholesome influence, but the popularization of the social sciences, and of social psychology in particular, awaits the work of some more masterly hand.

CHARLES A. ELLWOOD

University of Missouri

STRATTON, GEORGE MALCOLM. *Anger: Its Religious and Moral Significance.* N. Y.: Macmillan, 1923. Pp. x+277.

This is a monograph of exceptional psychological and sociological importance. In the opinion of the reviewer (who writes with a sociological bias) it is a model of what a psychological monograph, especially when it is the study of some single aspect of human behavior, should be, because it presents, not simply the results of introspection and laboratory experiment, but also a survey of literature and of objective social life. Probably, however, the book will be ignored both by psychologists and by sociologists who taboo any possible approach to their subjects from the side of religious psychology. It is, however, a scholarly work in the best sense of that term, and throws light not only upon the human mind, but also upon human society.

Professor Stratton begins his study with a psychological and ethical survey of the beginnings of anger, its social utility, and its place in morals. He then turns to a study of the place of anger, in contrast with love, in the great historic religious faiths, such as Judaism, Zoroastrism, Mohammedanism, Taoism, Vishnuism, Buddhism, Confucianism, and Christianity. He contrasts the martial religions, which glorify anger, such as Mohammedanism, with the "unangry" religions, such as Buddhism, and then with the religions of anger-supported love, such as Confucianism and Christianity. The result is that the author shows us in a very vivid way, not only the part which anger and love have played in religion, but also in human social life. Surely this is inductive science at its best and sanest.

The book closes with a discussion of the future of anger in western civilization. The author shows clearly that the better trend of our civilization, indeed its stronger, more normal trend, is to subordinate anger to love or good-will; but he also shows that good-will needs the motivating power of anger in its contest with the evils which prevent the best development of mankind. Here, then, is another scientific book, which, in its contention that we can and

should make anger a true servant of good-will, and that we need a religion of anger-supported love to dominate all of our institutions before we can have a right culture, closely approaches the social and religious attitude of Jesus. But perhaps this is its condemnation!

CHARLES A. ELLWOOD

University of Missouri

FORD, JAMES. *Social Problems and Social Policy.* Boston: Ginn, 1923. Pp. xiii+1027.

This book is made up of one hundred and thirty-two selections on the treatment and prevention of poverty, defectiveness, and criminality. Professor Ford has prefaced the book by a brief introduction of seven pages. Part 1 deals with social ethics, Part 2 with social methods, Part 3 with the problem of defectiveness, Part 4 with the problem of poverty, and Part 5 with the problem of criminality.

As a reference book this volume is valuable, for the selections have been carefully chosen, many of them are not easily accessible to the student in any other form, and nearly all of them were written by men whose works are still regarded as authoritative. Professor Ford has therefore performed a valuable service in bringing these selections together. The book is obviously intended not only for reference, but also as a textbook. Opinions will, perhaps, disagree as to whether suitable textbooks in the social sciences can be produced in this manner; but until they are produced in some better way, texts of this sort will have undoubtedly a considerable value.

CHARLES A. ELLWOOD

University of Missouri

DUMAS, GEORGES. *Traité de Psychologie.* Vol. I. Paris: Alcan, 1923. Pp. xiv+964.

The present work represents a noteworthy advance in a new direction in the presentation of psychological knowledge. Modern psychology with its increasing ramifications of research and its growing specialization is yielding a very profuse and varied fund of knowledge. This condition has rendered it impossible for any single individual to master the developments in all of the various branches. Yet, hitherto, the conventional manner of covering this extensive field has been through the textbook, which, however excellent it might be, always revealed the imperfections contingent on the impossibility

of one or two authors understanding the fullness of psychological knowledge. The *Traité de Psychologie* is a serious and careful attempt to fill this gap left by the failure to bring together the fruitful results of the different lines of psychological development. It is the work of a group of twenty-five French scholars collaborating under the editorship of Georges Dumas, Professor of Experimental Psychology at the Sorbonne. To each scholar was assigned the preparation of a topic on which he was a specialist. In this manner there has been produced a work marked by an authoritativeness and a thoroughness of content which should gain for the production a wide adoption.

The *Traité de Psychologie* appears in two volumes, the first of which is discussed in the present review. The plan of presentation has been to proceed from the simple to the complex. The first volume is conveniently divided into four books, each containing a number of related chapters. Each chapter, usually the work of a single individual, endeavors to present a precise exposition of the actual knowledge on that division of psychology; and, in addition, includes a detailed bibliography of the most important works in all languages, and also makes many suggestions for further researches.

Following an interesting preface by the late Th. Ribot, there appears the introduction contributed by André Lalande, Professor of Methodology of Sciences at the Sorbonne, dealing with the different aims of pyschology and the various methods which may be employed. The bulk of the discussion is concerned with a satisfactory adjustment of such methods as introspection, comparison, and laboratory experimentation. The first book of the volume, bearing the caption, " Conceptions preliminary to the Study of Psychology," is devoted to the exposition of morphological, neurological, and biological conceptions which form a necessary introduction to the study of human psychology. Et. Rabaud, Professor of Experimental Biology at the Sorbonne, contributes the first chapter, which deals with man's position in the animal series and with his morphological development. Then comes the contribution of L. Lapicque, Professor of General Physiology at the Sorbonne, who is concerned in establishing the relation between intelligence and the weight of the brain, in the animal series in general, and in man and woman in particular. J.-P. Langlois of l'Académie de Médecine follows with a discussion on the general physiology of the nervous system, in the course of which he considers the neurone, nerve excitation, nerve conduction, and cerebral behavior. The nature of the nervous system

is delved into in a more minute manner in the succeeding chapter, written by A. Tournay, assistant in comparative histology in the Collège de France. Drawing heavily on the science of physiology, he presents a detailed description of the nervous system. The concluding chapter of the first book contributed by Henri Wallon of l'Institut de Psychologie of the University of Paris, is a rather thorough consideration of consciousness from a biological standpoint. It endeavors to make an adjustment in the dualism of mind and body.

The second book of the volume is entitled, "The Elements of Mental Life." It considers the sensory or motor states which constitute such elements: simple reflexes, conditioned reflexes, sensations, emotions, etc. It begins with a thorough and, in all respects, excellent chapter on "Excitation and movement." The writers are Georges Dumas, editor, and H. Piéron, physiological psychologist at the Sorbonne. Careful attention is given to reflex movements, to the phenomenon of inhibition, to muscular contraction, to tonus, and to voluntary movements, for, as the authors say, all of these play a considerable part in the adaptation of the physiological life to the social life. The succeeding chapter on "Sensations" is the contribution of B. Bourdon, Professor of Philosophy in the University of Rennes. It is a conventional treatment of touch, sight, hearing, etc., made with fine detail, but, adding nothing of note. Its consideration in the light of the "Gestalt" psychology would be interesting. Next follows a comprehensive section on the affective states, written by L. Barat (revised by the editor) and by L. Dugas, Professor of Philosophy in the Lycée de Rennes. Pleasure and pain, the emotions, and the passions are given consideration with the main emphasis placed on their physiological aspects. "Imagery" is the topic of discussion in the next section, written by L. Barat and revised by I. Meyerson of the Sorbonne. The relation of images to thoughts and to sensations is the main theme, with the stress again directed to the physiological side. As a concluding section to Book II is a very interesting chapter, written by Andre Mayer of the Collège de France, on the influence of perception, imagery, sensations, and affective states on glandular secretions. The fruitful results which this new field promises to yield make the inclusion of this chapter especially noteworthy.

The third book of the volume carries the title, "The Sensory-Motor Associations." It begins with a thorough consideration of "Orientation and Equilibrium," ranging in content from the internal

adjustment of the various parts of the body to the "homing" sense in man. Ed. Claparède, Professor of Psychology at the University of Geneva, and G. Dumas, the editor, have written the chapter. The second chapter on the expressions of emotions, written by the editor, is the most complete and most satisfactory discussion of this difficult topic so far encountered by the reviewer. A too prompt acceptance of Cannon's work (now being seriously questioned) alone mars the presentation. G. Dumas has also contributed the following chapter on "Laughing and Weeping," which, after presenting the physiological bases of both, ends in a theoretical tag after these ever elusive and tantalizing topics. A chapter on the important topic of Speech by L. Barat (revised by Ph. Chaslin) dealing with spontaneous language, articulate language, and the relation of language and intelligence concludes Book III.

The fourth book considers the "General Forms of Organization," touching on such topics as habit, memory, attention, and association of ideas. The analysis of these topics should constitute a natural transition between the study of the elements of mental life and the study of the particular functions of mental life. In the chapter on "Habit and Memory" H. Piéron (mentioned above) sets forth the forms, laws and rôle of memory in a very detailed and satisfactory manner. The discussion on the "Association of Ideas" has been contributed by J. Dagnan and G. Dumas. It is the usual discussion on a topic which tends to became antiquated: the nature of association, the factors of variation therein, and the relation of the affective states to the association of ideas. Chapter III on "Attention" has been written by G. Revault D'Allonnes. Starting with the view that attention is a choice, largely guided, however, by interest, the author passes to the different forms of attention, the sensori-motor basis of attention, the measuring of attention, and the pathology of attention. It represents the traditional consideration of this topic, done, however, in greater detail and condensed into a unique synthesis. The final chapter of the book is contributed by the reputable Pierre Janet. It is entitled "Psychological Tension and its Oscillations." Following an elaboration of the nature of the "tension," Janet concludes with a discussion of how it is affected by age, depression, excitability, sleep, fatigue, etc. This chapter brings the volume to a close.

The reviewer has refrained from making any criticisms of the content of the volume but has been desirous instead to indicate the nature and extent of the materials covered in this important work. In rounding out a judgment several points demand consideration. For

one thing, one should note that the volume as a whole offers nothing strikingly original in content. It serves more as a sketchmap of a field which has been previously surveyed; and while it is fertile in suggestions pertaining to topics of further investigation, it does not aim to present new theories or unique contributions. Further, as one would naturally suppose in a collaboration of many scholars in such an undeveloped science as psychology, the work is not always marked by a consistency in point of view or in theoretical presentation. Yet any deficiency in unity of content is compensated by the even more valuable unity of aim and method. Despite whatever the volume may lack in the way of originality or unity of content, it justly deserves to rank as the most important attempt at a comprehensive synthesis in the field of psychology which has been made, either here or abroad. Its thoroughness of elaboration, richness of detail, and unity of relationship should make the work indispensable for those who desire easy access to concise and adequate knowledge of psychological data and theory. The work is bound to be of great value to professional psychologists, alienists, neurologists, and social scientists—in fact to all who have been struggling to keep abreast of developments in a science whose extent prohibits individual mastery. A second volume promised for early publication should make the two serve as a veritable small encyclopedia.

HERBERT BLUMER

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NOTES AND NEWS

Dr. W. H. Pyle, of the University of Missouri, has gone to Teachers' College, Detroit, to carry on research and teaching on the psychology of learning.

The National Research Council at Washington, D. C., has recently organized a Committee on Child Development with Professor Bird T. Baldwin, Director of the Child Welfare Research Station of the University of Iowa, as its chairman. Invitations have been issued to twenty-five leading specialists in the United States and Canada in anthropology, nutrition, pediatrics, psychology and psychiatry to meet in conference in New York, October 23, 24 and 25. A comprehensive research program in child development based on experimental procedure over a period of years and on the integration of allied sciences will be discussed and formulated.

The Sixth International Congress of Philosophy will be held, under the auspices of the American Philosophical Association on September 13–17, at Harvard University, Cambridge, Mass. The sessions of the congress will be held in four divisions: 1. Metaphysics; 2. Theory of Knowledge, Logic and Scientific Method; 3. Theory of Values; 4. History of Philosophy. For information write the corresponding secretary, Professor John J. Coss, 531 West 116th Street, New York City.

Dr. Edwin M. Bailor has been appointed assistant professor of psychology at Dartmouth College.

Mr. Edward B. Greene, formerly of the Department of Employment of the Western Electric Company, has been appointed instructor in psychology at Wesleyan University.

On October 15, Professor Pierre Janet, of the College de France, lectured before the combined seminars of the psychological laboratory of the University of Pennsylvania on A Behavioristic Interpretation of the Sentiments.

The following awards have been made from the Milton Fund for Research at Harvard University: to Walter F. Dearborn for an investigation of the mental and physical development of school children and to William McDougall for his investigation on the transmission of acquired characters.

Vol. 22, No. 12 December, 1925

THE PSYCHOLOGICAL BULLETIN

1. GENERAL

812. FISHER, S. C., The Psychological and Educational Work of Granville Stanley Hall. *Amer. J. of Psychol.*, 1925, **36**, 1–52.

The early work of Hall was in the field of experimental psychology and included studies in sensation, perception and movement. When he resumed active psychological work after the founding of Clark, his interest in genetic psychology and child study, and their application to educational problems, had become dominant. All of his later writings are permeated and unified by the conviction that the understanding of the present is possible only in the light of the whole evolutionary process. Hall's fundamental "general psychonomic law" is an adaptation to the mental sphere of the concepts of biological evolution and the dependent doctrine of physical recapitulation. This principle is the organizing and guiding thread of his whole psychological and educational doctrine. Beyond it, he makes no attempt to evolve a system in the usual sense of that term, and is everywhere impatient with classification as well as with detailed experimental procedure. The major assumptions of Hall's psychology have been widely called in question, and his work contains many internal contradictions. But it must be recognized that he was the pioneer, prophet and propagandist of a young and growing science rather than the experimenter or systematist. As such, there is no field of education but has felt the influence emanating from him and has been markedly benefited. G. J. RICH (Chicago, Ill.).

813. MYERS, C. S., Some Present Tendencies of Psychology. *Amer. J. of Psychol.*, 1925, **36**, 53–65.

Psychology is tending away from mental anatomy and atomism, which yield but a part of psychological truth, to a direct study of

experience as it occurs. It is also going beyond introspection to a study of unconscious processes, trying to find a unified type of activity which will explain the various manifestations which are called mental. Psychology must face, in common with physiology, the problem that both in life and in mind there is something which differentiates them from the activities of lifeless substance. There is a " purposefulness " imposed upon the organism which becomes in the higher forms of life a " purposiveness," a self-conscious realization of the existence of purpose. The explanation of life and mind as mechanism has led the way to scientific progress. But it is not the whole story. Purpose and the consciousness of purpose are necessary to a complete understanding of mental life. G. J. Rich (Chicago, Ill.).

814. Weber, C. O., The Reality of Chances. *Amer. J. of Psychol.*, 1925, **36**, 66–72.

In the problem of individuality, the decision between the three alternatives of mechanism, finalism and vitalism rests less upon reason than it does upon a sort of conscience within us. Neither mechanism nor finalism can render a consistent account of life. Viewed from the standpoint of our immediate experience, vitalism alone justifies the reality of will, of pain, of effort, and of decision: all of which are constantly present in life and consciousness. Mechanism is incapable of representing the phases of experience that make up the richest part of life as actually lived. Finalism, on the other hand, seeks to escape the weaknesses of mechanism by the futile expedient of accepting its essential meaning under guise of a different terminology. G. J. Rich (Chicago, Ill.).

815. Thurstone, L. L., Influence of Freudism on Theoretical Psychology. *Psychol. Rev.*, 1924, **31**, 175–183.

The new psychology differs in terminology, origin and subject matter from the old. Traditional psychology has concerned itself with momentary mental states and momentary behavior whereas the new psychology examines basic and permanent tendencies in human nature. Psychoanalysis, though unscientific, has called attention to the deficiency of content of the traditional psychology. P. T. Young (Illinois).

816. Leuba, J. H., Freudian Psychology and Scientific Inspiration. *Psychol. Rev.*, 1924, **31**, 184–191.

Freudian psychology is of value because it is a movement towards a dynamic conception of man and because it is radically deterministic. It has performed a service to psychology in calling attention to the possibilities of recall and in opening the door to the study of central problems of personality and behavior. In cases of scientific inspiration, such as mathematical inventions of Henri Poincaré, explanation can be made without positing unconscious mental activity. P. T. Young (Illinois).

817. Lashley, K. S., Physiological Analysis of the Libido. *Psychol. Rev.*, 1924, **31**, 192–202.

Freud regards the libido as free mental energy derived from the sex instinct and capable of being repressed or drained off. Freudian dynamics may be spoken of as a system of "psycho-hydraulics." Recent experimental studies have shown that the reactions of the male rat are reducible to stimulus-response relations, and also that there is a definite relation between autocoids from the testis and sexual reactions. Undernutrition and other factors are known to be involved as conditions of sexual behavior. The evidence points to the view that sexual behavior consists of specific responses to definite patterns of stimulation. There is no evidence for the existence of free energy, libidinous or other, fulfilling the requirements of the libido. Psychoanalysis has not furnished direct evidence for the existence of libidinous energy, and other principles have been suggested which are adequate to the facts. P. T. Young (Illinois).

818. Jastrow, J., The Neurological Concept of Behavior. *Psychol. Rev.*, 1924, **31**, 203–218.

It is misleading to place neurology in the center of the psychological picture for we know less about nerves than about mind. It is impossible to say what insight and control will be gained by further knowledge of the neural mechanisms. The position of the behaviorist is partly fallacious and his concept of behavior is meager to the point of poverty. The study of mental disorders, such as hysteria and neurasthenia, has added to the neurological conception of behavior. This conception also finds an application in studies of the child, such as the distortion of the feeding habit and problems related to thumb sucking. Finally, Freudian psychology furnishes a clue

to the neurological interpretation. Freudian principles will eventually be absorbed in the general neurological view of behavior. P. T. Young (Illinois).

819. Woodworth, R. S., Four Varieties of Behaviorism. *Psychol. Rev.*, 1924, **31**, 257–264.

Behaviorism as a methodology offers nothing positive. Behaviorism is a program rather than a methodology. Behaviorism is not necessarily identical with the neuromechanistic interpretation; nor can we tie it up with the linguistic conception of thought. In attempting to answer the question, "Am I a behaviorist?" Woodworth replies: ". . . I do not know, and do not much care. If I am, it is because I believe in the several projects put forward by behaviorists. If I am not, it is partly because I also believe in other projects which behaviorists seem to avoid, and partly because I cannot see any one big thing, to be called 'behaviorism' . . ." P. T. Young (Illinois).

820. Peterson, J., Intelligence Conceived as a Mechanism. *Psychol. Rev.*, 1924, **31**, 281–287.

Associationism has furnished the main basis for mechanistic views of behavior. Several weaknesses of associationism are pointed out. Freudian writers have ascribed force to intelligence or to consciousness. This view is fallacious. The writer defines intelligence as a "biological mechanism by which diverse impulses are brought together and given a somewhat unified and consistent effect in behavior." P. T. Young (Illinois).

821. Young, P. T., The Phenomenological Point of View. *Psychol. Rev.*, 1924, **31**, 288–296.

The psychologist, in common with other men of science, should start his study with the acceptance of phenomena just as they are given. Certain distinctions among phenomena have been made in order that a very complex situation may be handled conveniently as, for example, the distinctions among physical, biological and mental phenomena. Independent of such distinctions is the experience relation. Any particular phenomenon may be regarded as an existence which is related to the living body of the person observing and reporting it. It is possible to regard the biological organism as a physical object capable of movement or as a psychophysical organism

capable also of experience. Consistent physical behaviorism is limited to the study of movements of the organism. The definition of psychology as the study of mental processes observed from a fixed point of view is too narrow since it ignores the great bulk of experience relations discoverable within the order of phenomena. It is not so much the observation of phenomena from a fixed point of view as the interpretation of phenomena in a particular way that will bring order into psychology. P. T. YOUNG (Illinois).

822. CALVERTON, V. F., The Rise of Objective Psychology. *Psychol. Rev.*, 1924, **31**, 418–426.

The paper is an attack upon subjective psychology and the study of consciousness. Psychology may become a science through the objective study of behavior. Objective psychology has a social philosophy which as yet is little developed. P. T. YOUNG (Illinois).

823. LYDENBERG, W. B., The Dream of Materialism. *Open Court*, 1924, **38**, 385–394.

A critique of the materialistic concept of consciousness as an epiphenomenon explicable in purely mechanistic terms. Sentimental, logical, and metaphysical arguments against this view, precede an analysis of the nervous system and its actual and possible functions. The author offers several questionable suggestions involving the acceptance of telepathy or other unknown forces. He advances the hypotheses that self-consciousness is a product of intercerebral stimuli, and defines a number of psychological functions in terms of cerebrally contained impulses of adjustment to conditions. He sketches a possible biological terminology for stages of psychogenesis culminating in self-consciousness. Deeming the results unsatisfactory he urges the physiological psychologists' incapacity to define illusion which has no place in a mechanical scheme of things. Moreover, knowledge processes materialistically conceived, are limited by their material medium and cannot attain to ultimate causes, or to the nature of a possible knowledge not so conditioned. C. M. DISERENS (Cincinnati).

824. REISER, O. L., Life as a Form of Chemical Behavior. *Monist*, 1924, **34**, 150–160.

Most scientists incline to the belief that living matter has evolved from nonliving, a monistic view in accord with the law of Parsimony

which divides Science from Superstition. There is a movement away from the "stuff" theory of Life, to the "engine" theory which explains life in terms of chemical interactions. Life is not only the adjustment of internal to external relations but also the mutual adjustment of intraorganismic transformations. The phenomena of organicity do not yet admit of an adequate mechanical model but biologists may legitimately look forward to one in the future. The gaps in the knowledge of nature are not so unbridgeable as was once supposed. "Many of the phenomena of living matter can be duplicated in the behavior of nonliving matter." Integrating factors appear not as of a different but of a more complex order. The laws of energy transformation apply to organic as well as inorganic transformations. In short the behavior of living matter, though not deducible from the laws of thermodynamics "is no more inconsistent with these laws than molecular behavior is inconsistent with atomic or electronic behavior." The point of view developed is summed up in ten empirical laws, the last three of psychological import. Thus Memory may be regarded as "a general and fundamental function of living matter." The nervous system does not represent a new integration imposed on protoplasm, but a product of primary integrating factors which make the organism an orderly whole. "Memory is a complex synthesis of engrams." Mental processes as dependent on neural tissue constitute the supreme synthesis of Nature." Life is therefore not a Metaphysical entity but a function of chemical behavior. C. M. Diserens (Cincinnati).

825. Eldridge, S., Imperfect Correlations Between the Physical and the Vital. *Monist,* 1924, **34**, 260–291.

The writer presents a comparison, by the method of concomitant variations, between vital, mental, and social processes on the one hand, and the associated physico-chemical processes on the other hand. In the first place organic structures and functions are independent both of types of physico-chemical processes and of numerically identical physico-chemical processes. Variations in memories, habits and other types of mental function are not closely correlated with the associated physico-chemical factors. Nor is there a correlation of the latter with cultural facts. The latter are a function of thought which has little in common with its material substratum, since the latter disappears while thought persists and accomplishes cultural work, indefinitely. Mind or thought moreover differs from mass in possessing retrospective and anticipatory aspects which the latter

lacks. Consciousness can not be equated with potential energy, because of inherent contradictions in such assumption. In the same way, the causal efficacy of thought can not be transferred to its instruments which may change indefinitely while the same thought persists. The conclusion is that correlations between the vital and mental, and the physical series of phenomena are too imperfect to support the view that either is wholly determinative of the other. C. M. DISERENS (Cincinnati).

826. LENOIR, R., Lamarck. *Monist,* 1924, **34**, 187–236.

Here is a study of the entire scientific system of LaMarck in relation to his century and environment as well as the course of subsequent thought. The paper contains a valuable statement of Lamarck's views on psychology which were broader and more critical than those of Condillac, and the Ideologists, LaMarck's contemporaries. He classifies animals as apathetic, sensible or intelligent according to the degree of development of the nervous system and the successive appearance of automatic response, sensibility or feeling, and the presence of mental functions, ideas, etc., which repercuss upon the earlier stages. Thus he gives a genetic account of the appearance of intelligence instead of tracing all psychological modes to sensation. Moreover unlike the ideologists and their successors, he does not confine himself to considering the influence of the physical on the psychical and moral, but also recognizes the reaction of the latter on the physical. In short he makes of mind a genuine biological factor and maintains a unity of view which has too often been lost sight of. C. M. DISERENS (Cincinnati).

827. GUNN, J. A., Ribot and His Contribution to Psychology. *Monist,* 1924, **34**, 1–14.

Ribot's thought was principally influenced by Lachelier, Claude Bernard, Charcot, and Taine, to whom various tendencies in his subsequent work can be traced. Taine laid the foundations of the scientific psychology which Ribot greatly helped to develop through individual contributions and as editor of the *Revue Philosophique.* Ribot's work is both critical and constructive. As a historian of psychology he produced valuable work on German and English psychology, besides translating Spencer. Among more constructive work are a valuable study of psychological heredity, a series of studies on abnormal psychology, the well known works on the affective life. General ideas and imagination, and a very important

article on Method in which the relative value and limitations of introspection as well as of supplemental psychological methods are clearly defined. Methods according to Ribot are: subjective, objective, and experimental, the latter subdivided into three divisions (1) physiological, (2) psychophysical and (3) pathological. Among Ribot's specific contributions are: statements of the law of psychical disintegration and the principle of rationalization, as well as demonstrations of the dominant rôle of emotional and unconscious trends. He thus anticipated or initiated some of the most important developments of recent psychology. C. M. Diserens (Cincinnati).

2. NERVOUS SYSTEM

828. Huggett, A. St. G., and Mellanby, J., Action of Adrenin on the Central Nervous System. *J. of Physiol.*, 1924, **59**, 387–394.

Adrenin does not affect muscle tone, decerebrate rigidity, or the reflexes of pupil, conjunctiva, or limbs. Its effect on the respiratory movements (adrenalin apnoea) appears to be by a specific action on the cells of the respiratory center. L. T. Spencer (Yale).

829. Langley, J. N., Vaso-motor Centers Part III. Spinal vascular (and other autonomic) reflexes and the effect of strychnine on them. *J. of Physiol.*, 1924, **59**, 231–258. L. T. Spencer (Yale).

830. Lusk, G., and DuBois, E. F., On the Constancy of the Basal Metabolism. *J. of Physiol.*, 1924, **59**, 213–216.

Cases cited indicate that basal metabolism may be measured within an error limit of $\pm$ 15 per cent for dogs and $\pm$ 7.6 per cent in man over a number of years. L. T. Spencer (Yale).

3. SENSATION AND PERCEPTION

831. Gordon, K., Group Judgments in the Field of Lifted Weights. *J. of Exper. Psychol.*, 1924, **7**, 398–400.

Two hundred students were used for the present experiment. Each one was required to arrange a series of ten weights in the order of heaviest to lightest. The object was to discover whether or not group judgment is more nearly correct than individual judg-

ment. First the arrangement by each student was correlated with the true order and the mean of these correlations calculated. Next the two hundred orders were treated in groups of five, the average position of each weight calculated, and the resulting order correlated as before, giving forty correlations instead of two hundred. The mean correlation here was .68. For groups of ten each it was .79; for groups of twenty it was .86; and for groups of fifty it was .94. "In other words, the results of the group are distinctly superior to the results of the average member and equal to its best members. M. B. PRATT (Wellesley).

832. MYERS, C. S., A Theory of Sensory Adaptation. *J. of Physiol.*, 1924, **59**, xlix–l.

Instead of Hering's conception of the antagonism between dissimilation and assimilation it is suggested that the principle of reciprocal inhibition be substituted. Adaptation then represents an active balance of excitation and inhibition. This implies two opposed sensory mechanisms instead of Hering's single substance and also "a certain 'activity' underlying the maintenance of adaptation." L. T. SPENCER (Yale).

4. FEELING AND EMOTION

833. CONKLIN, V., and DIMMICK, F. L., An Experimental Study of Fear. *Amer. J. of Psychol.*, 1925, **36**, 96–101.

The emotion of fear was set up under laboratory conditions and subjected to psychological description. The emotive pattern is akin to the pattern of perception—core and context. The core consists of those sensory elements which are referred to the stimulus. In addition, there is a context which consists of images or sensations or both. As an integral part of both core and context, there is always an effective element, unpleasant in this case. The emotive pattern also resembles the fore-period of the action consciousness inasmuch as it carries the meanings both of a movement and of the result of that movement. The wide differences found among the various classifications of emotions are due to their being based upon the action-meanings which the emotive consciousness carries rather than upon the mental components or patterns of the emotions. The usual classification is logical rather than psychological, and depends upon the classifier's tendency to explicate or to generalize. G. J. RICH (Chicago, Ill.).

834. Stone, A. R., The Reaction of Memory to Affective States. *Amer. J. of Psychol.*, 1925, **36**, 112–123.

The effect of an emotional stimulus, interpolated in a two-minute interval between learning and recall, upon memory for nonsense syllables was investigated. The presence or absence of emotional effect was determined by change in blood pressure, supplemented by introspective reports. The results show that memory is greatly influenced by the subject's effective state at the time of attempted recall. Some states help, some hinder; others may have either result, depending on the individual. G. J. Rich (Chicago, Ill.).

835. Landis, C., Studies of Emotional Reactions. 1. "A Preliminary Study of Facial Expression." *J. of Exper. Psychol.*, 1924, 7, 325–341.

Instead of photographing persons in the act of voluntarily expressing a certain emotion the writer took pictures of students who were given a series of unexpected stimuli to emotion and were instructed merely to "act natural." Music, pictures, odors, frogs, and electric shocks were used as stimuli. On the basis of the resulting photographs it was possible to make analyses of disgust, repulsion, anxiety, and pain. It was found in a check series for which several subjects were asked to reproduce voluntarily the expressions which they had already made involuntarily, that these forced expressions were more like those which have come to be thought of as typical of the various emotions than were the expressions of the first or "natural" series. Besides being often at variance with the accepted traditions these latter showed great differences among themselves. In some cases where it was expected, no expression of emotion was present at all. M. B. Pratt (Wellesley).

836. Hubbard, L. M., Complex Signs in Diagnostic Free Association. *J. of Exper. Psychol.*, 1924, 7, 342–357.

The present article is a study of the validity of Jung's statement that perseveration of emotional tone is very significant in diagnostic association tests, and also of the validity of his assertion that this emotional tone itself can always be taken as indicative of some particular complex. An analysis was made of the results of Jung's association-test given, always in haphazard order, to one hundred subjects. "From the computations it would seem that the perseveration tendency of complex signs is too small to be of much value for

diagnostic purposes, at least with normal subjects." In the second part of the investigation a similar analysis was made, by means of which it was discovered that complex signs are to a large extent a function of position in the series. Laughter, for example, occurs most often at the beginning of the series, while the number of individual reactions increases towards the end of the series. The writer therefore draws the conclusion that conventional indications of complexes cannot be considered significant unless they occur in a place where as a rule they are seldom found. M. B. PRATT (Wellesley).

837. JONES, M. C., The Elimination of Children's Fears. *J. of Exper. Psychol.*, 1924, 7, 382–390.

Watson has shown how fears are acquired in infancy. The present writer attempts to show how they may be eliminated. An institution in which generally normal children were cared for was chosen as a laboratory, and 70 of these children, from three months to seven years of age, were studied. Various methods for eliminating fears were employed: the method of elimination through disuse; the methods of verbal appeal, negative adaptation, repression, distraction, direct conditioning, and social imitation. Unqualified success in removing fear was achieved in only two cases. Generally a combination of methods was used, but the two which seemed most effective were those of direct conditioning and of social imitation. M. B. PRATT (Wellesley).

838. MOSS, F. A., Note on Building Likes and Dislikes in Children. *J. of Exper. Psychol.*, 1924, 7, 475–478.

The writer describes experiments in which conditioned responses were built up successfully in two children, aged two and four. M. B. PRATT (Wellesley).

839. CORALINK, A., Fear. *Open Court*, 1924, 38, 16–20.

Fear is the most intense yet incomprehensible of human emotions. So-called genetic explanations of fear are mere descriptions. All we know, is that fear is always connected with a desire to escape somewhere, and that its source is some kind of uncertainty. Reality is never terrible. Fear is therefore a creative force, a stimulus to the imagination in science, religion, and all else that makes for civilization. A new South American drug is said to banish fear but if true, its value is questionable since the control and creative employ-

ment of fear rather than its annihilation is desirable. C. M. Diserens (Cincinnati).

5. MOTOR PHENOMENA AND ACTION

840. Jacobson, E., Progressive Relaxation. *Amer. J. of Psychol.*, 1925, **36**, 73–87.

A method is described to relax the striated musculature in a progressive manner, in which the subject is trained to continue the process of relaxation, or negative contraction, to an extreme degree with special emphasis upon the muscles of the ocular region and of the speech apparatus. The degree of relaxation may be judged either by objective signs or, subjectively, by the absence of the sense of muscular tenseness. The subjects learn, without direct suggestions or leading questions, to observe slight and fleeting variations in these sensations, even in the small muscles. All the subjects who attained high skill in progressive relaxation found that with visual imagery there is a sense of tenseness in the ocular muscles. Without such faint tenseness the image fails to appear, and with complete ocular relaxation the image disappears. Motor or kinaesthetic imagery follows a similar course. "Inner speech" ceases with progressive relaxation of the muscles of the lips, tongue, larynx and throat. Auditory imagery is attended by tenseness, sometimes felt in the auditory apparatus, but characteristically in the ocular muscles (looking towards source of sound), and with relaxation of these tensions the auditory image is absent. The imageless state is attained only in complete relaxation, which passes into natural sleep if maintained for a relatively prolonged time. With progressive muscular relaxation, attention, recollection, thought-processes and emotion gradually diminish. G. J. Rich (Chicago, Ill.).

841. Woolbert, C. H., A Behavioristic Account of Intellect and Emotions. *Psychol. Rev.*, 1924, **31**, 265–272.

In contrasting intellectual and emotional behavior it is important to distinguish between the extensity and intensity of certain bodily changes. Intellectual processes tend to intensify tonicity and movement in a restricted field of muscles while emotional processes tend to raise or lower tonicity in a field approximating the total organism. In speaking of the difference in question it would be better to use the adjectives, *intellectual* and *emotional*, than the nominatives, *the intellect* and *the emotions*. P. T. Young (Illinois).

842. WATSON, J. B., The Unverbalized in Human Behavior. *Psychol. Rev.*, 1924, **31**, 273–280.

The organization of bodily habits may or may not be paralleled by verbal organization. In infants too young to talk a great deal of organization goes on. The manual habits of three-year-and-under infants are unverbalized and the only way to test "memory" is to place infants in a situation where bodily organization can be exhibited. The weakness of the Freudian assumption of the unconscious is this: the infant never had verbal organization for the experiences supposed to be repressed in the unconscious. Infancy turns out to be a wholly natural state of being. There is another field in which unverbalized organization goes on. Not only in infancy but throughout life our visceral system is subject to the laws of habit formation. P. T. YOUNG (Illinois).

843. WELLS, F. L., Notes on "False" Reactions. *Psychol. Rev.*, 1924, **31**, 311–320.

The studies of Wells and Sturges, Henmon, and Grace Bird are discussed. The question of the relation of speed of reaction and tendency to false reaction is raised. Data on the false reactions to black and white are presented. P. T. YOUNG (Illinois).

844. CASON, H., Criticisms of the Laws of Exercise and Effect. *Psychol. Rev.*, 1924, **31**, 397–417.

The writer criticises the law of exercise (use and disuse) as set forth principally by Thorndike, and also the law of effect. Under the latter heading the adequacy of satisfiers and annoyers as agents for stamping in and stamping out reaction tendencies is questioned. Thorndike's doctrines are said to be based upon a worn out affective psychology; and furthermore these laws are anthropomorphic and mentalistic. P. T. YOUNG (Illinois).

845. NIXON, H. K., A Sphygmograph with an Electric Attachment for Recording Pulse Rate at a Distance. *J. of Exper. Psychol.*, 1924, **7**, 358–370.

The article describes a new sphygmograph which can be attached to the pulse in the wrist by means of a simple lever-device and a pair of weights which control the amount of pressure brought to bear upon the wrist. The apparatus is so made that it will remain properly adjusted for an indefinite length of time, and for this reason has

been found useful in ordinary laboratory work. The record can be made with ink upon plain paper as well as by marking on a smoked drum. The writer appends a survey of sphygmographic devices which already have been employed, and also adds a long bibliography. M. B. Pratt (Wellesley).

846. Dashiell, J. F., An Experimental Isolation of Higher Level Habits. *J. of Exper. Psychol.*, 1924, 7, 391–397.

The writer of the present article attacked the problem of the learning-plateau by using three groups of subjects. Each group was given a more or less complicated form of the same task to learn. Group *S* learned to use a code and practiced the same code every day; Group *C* learned a new code every day; and Group *I* learned a new code every day which was of such a nature that it would presumably produce interference with the code learned on the previous day. The results show the hierarchy which might have been expected: the rate of learning proved to decrease in the order of Group *S*, Group *C*, Group *I*. The writer concludes that "by employing a type of response-complex (substitution) that involves part-responses readily changeable and controllable, and by assigning to different learning-groups problems calculated to arouse over a series of trials different combinations of general and of particular responses, clear differentiations in rates of learning were exhibited as due to these different combinations." M. B. Pratt (Wellesley).

847. Tuttle, W. W., The Effect of Attention or Mental Activity on the Patellar Tendon Reflex. *J. of Exper. Psychol.*, 1924, 7, 401–419.

A method was worked out whereby the patellar tendon of a subject could be stimulated at regular intervals and with uniform intensity by a hammer-device, and the intensity of the reflex measured by the height of the resulting kick. At the same time that the subject was being given regular blows on the knee he was engaged in casual conversation with the experimenter, or engrossed in the solving of some difficult problem, or was as passive and inattentive as possible. The intention was to discover what the relation is between muscle-tonus as measured by the knee-jerk and what is commonly called attention. The records show clearly that there is an extremely close relation: the height of the kick was greatest during problem-solving, not nearly so great during conversation, and barely present at all during inattention. The writer states that

there are three ways in which this fact may be interpreted, namely, that muscle-tonus is (a) one of the factors in the attentive process, (b) a function of the attentive process, or (c) the process of attention itself. The writer favors the last interpretation. C. C. PRATT (Harvard).

848. CARR, H. A., and KELLEY, C. M., The Curve of Learning in Typesetting. *J. of Exper. Psychol.*, 1924, **7**, 447–455.

This article deals with an analysis of the factors entering into typesetting, and with the records, as represented by curves of speed and accuracy, obtained by a class learning to set type under actual school conditions. M. B. PRATT (Wellesley).

849. LIDDELL, E. G. T., and SHERRINGTON, C. S., Further Observation on Myotatic Reflexes. *Proc. of Royal Soc.*, 1925, **97**, 267–283.

Influence of the otic labyrinth on myotatic reflex of the knee extensor is studied. Inhibition of the knee extensor by a myotatic reflex obtained by stretch of the knee flexors is not reversed by strychnine. This is related to the suggestion that strychnine reversal occurs only when the nerve trunk stimulated contains afferent fibers leading to both excitatory and inhibitory motor neurones. L. T. SPENCER (Yale).

850. FURUSAWA, K., HILL, A. V., LONG, C. N. H., and LUPTON, H., Muscular Exercise, Lactic Acid and the Supply and Utilization of Oxygen. Parts VII–VIII. *Proc. of Royal Soc.*, 1924, **97**, 155–176.

The relation of oxygen intake and requirement to severity and duration of muscular exercise is studied. L. T. SPENCER (Yale).

851. HILL, A. V., LONG, C. N. H., and LUPTON, H., Muscular Exercise, Lactic Acid and the Supply and Utilization of Oxygen. Parts IV–VI. *Proc. of Royal Soc.*, 1924, **97**, 84–138.

Methods and results of study of recovery and oxygen debt at the end of severe and moderate exercise in man are described. L. T. SPENCER (Yale).

852. BIRCH, J., The Origin and Development of Instincts. *Open Court*, 1924, **38**, 594–604.

Recognizing the general disagreement as to the definition of instincts and their relation to reason, the writer gives a useful sum-

mary of views, from Paley to Wundt, and concludes " that by instinct is implied the generic term compromising all those faculties of mind which lead to the conscious performance of actions which are adaptive in character but pursued without necessary knowledge of the relationship between the means employed and the ends attained." Such instincts may characterize both plants and animals. They are distinct from reflex and automatic acts, in lacking a precise external stimulus but being rather, responses to complex external conditions of the organism. Their development is either forced upon the individual by environment or is a mere unfoldment of the chemical potentialities of the organism. In man, instincts exhibit complicated interrelationships and in many cases are nonadaptive survivals from a prehuman stage of evolution. C. M. Diserens (Cincinnati).

6. ATTENTION, MEMORY AND THOUGHT

853. Stumberg, D., A Comparison of Sophisticated and Naïve Subjects by the Association-Reaction Method. *Amer. J. of Psychol.*, 1925, **36**, 88–95.

In a simple association-reaction test, in which no emotional feature was introduced, sophisticated subjects were able to prevent detection much of the time. The methods they used to accomplish this end included: lengthening the reaction-time to certain noncrucial words; lengthening all reactions so much that no crucial differences would appear; associating noncrucial words with others in the same set; having words in readiness as responses to probable test-words; and using a definite mental set, no matter what word appeared. The method is unreliable when the subjects are sophisticated. G. J. Rich (Chicago, Ill.).

854. Bethel, J. P., An Experimental Investigation of the Influence of Certain Weather Conditions upon Short Periods of Mental Work. *Amer. J. of Psychol.*, 1925, **36**, 102–112.

The effect of weather conditions was studied by means of tests of visual memory (immediate and delayed recall of nonsense syllables) and of auditory memory (immediate recall of numbers), performed weekly over a period of 4 months. There seemed to be no quantitatively measurable influence of weather conditions upon visual memory in this experimental situation. Relative humidity, barometric pressure and temperature appeared to affect efficiency in

auditory memory inversely, *i.e.*, as humidity, temperature and pressure rise, the scores for auditory memory become lower. The results indicate that barometric pressure is the most important factor; a low pressure is favorable to mental work. To properly interpret results of this sort, introspective reports of the subjects' affective states should be obtained. G. J. Rich (Chicago, Ill.).

855. Dallenbach, K. M., Dr. Oberly on "The Range for Visual Attention, Cognition and Apprehension." *Amer. J. of Psychol.*, 1925, **36**, 154–156. G. J. Rich (Chicago, Ill.).

856. Pyle, W. H., A Theory of Learning. *Psychol. Rev.*, 1924, **31**, 321–327.

After presenting some of the chief facts about learning the writer presents a physiological theory. Three laws of brain action which account for the facts of learning are: (1) simultaneous brain activities are connected, (2) strong connections are formed only in focalized brain activity, (3) the more vigorous the focalized brain action, the stronger are the associative bonds that are formed. The present theory stresses the importance of (2). P. T. Young (Illinois).

857. Watson, J. B., The Place of Kinaesthetic, Visceral and Laryngeal Organization in Thinking. *Psychol. Rev.*, 1924, **31**, 339–347.

When an object stimulates the human organism the response may be kinaesthetic involving gross manual or other movements, or it may be verbal involving the laryngeal muscles, or it may be visceral involving the smooth muscles and glands of the organism. Habit organization may proceed on any one of these three levels. Any one of the three types of response may become conditioned and may appear as a substitute response for an absent object. Thinking is chiefly subvocal talking but it may also involve manual and visceral organization. Thinking is possible without implicit speech behavior. P. T. Young (Illinois).

858. Hollingworth, H. L., Particular Features of Meaning. *Psychol. Rev.*, 1924, **31**, 348–368.

The writer considers analytically a variety of features of the meaningful event. The scope of the paper is indicated by the follow-

ing section headings: native and learned sequences; redintegration and conditioned reflex; is "telescoping" also meaning?; levels of meaning (three levels—postural, autonomic, intellectual); meaning and logical implication; perception and thought; completeness and incompleteness; thoughts and things; confidence and development; the problem of identity. P. T. Young (Illinois).

859. Lashley, K. S., Studies of Cerebral Function in Learning (VI). *Psychol. Rev.*, 1924, **31**, 369–375.

The doctrine that repeated passing of the nerve impulse across the synapse lowers synaptic resistance is widely accepted but no direct evidence for such synaptic changes has ever been obtained. It is not sound to argue from the gradual improvement in function during learning to a change in synaptic resistance with repetition of stimulation. In some cases a single performance fixes a habit. Professor Lashley presents two experiments of his own which are incompatible with the traditional view. (1) The left eye of a rat was blindfolded and the animal was trained in a Yerkes discrimination box. Later when the right eye was blindfolded the discrimination was made perfectly with the left eye. The wearing down of resistance in the afferent tract from the right eye could not affect the tracts from the left eye. (2) The right precentral gyrus of a cebus monkey was cauterized and paralysis of the left arm and leg resulted. The monkey was then trained to open latch boxes with the right hand. Later the left precentral gyrus was destroyed with a resulting paralysis of the right hand. When the animal recovered there was perfect transfer of the habit to the left hand which was paralyzed during training. In this case neural paths are utilized which were not activated during learning and the wearing down of synaptic resistance offers no explanation. P. T. Young (Illinois).

860. Adams, H. F., The Formation of Associations. *Psychol. Rev.*, 1924, **31**, 376–396.

The author modifies McDougall's drainage theory by introducing the concept of double neural tracks connecting cortical areas. The revised theory depends upon the "radiation" of nerve energy and upon a principle of "attraction." The latter means a lowering of synaptic resistance such that nervous energy flows towards the excited cortical center. This theoretical view is elaborated to take into account such phenomena as the relation between attention and association, inhibition and facilitation, backward and forward association, remote associations, associative inhibition, the effect of

rhythm, fluctuation of attention, association and involuntary attention, retroactive inhibition, distributed repetitions. P. T. YOUNG (Illinois).

861. McCLATCHY, V. R., and COOPER, M., A Psychological Study of Linguistic Abilities with Reference to the Results of Word Association Tests. *J. of Exper. Psychol.*, 1924, 7, 371–381.

Four tests were used in this study: a free association test devised especially for the particular students who took part, an analogies test (not described in the text), a proverbs test which required the pairing off of Arabian and English proverbs, and a sentence completion test in which a short story with many spaces left blank was to be completed. The reaction-times and the number of normal, or conventional, responses in test 1 were correlated with the excellence of performance in tests 2, 3, and 4, with the result that a close relation was found to exist both between conformity of response and linguistic ability as revealed in tests 2, 3, and 4, and between quickness of response and linguistic ability. M. B. PRATT (Wellesley).

862. WHITELY, P. L., The Dependence of Learning and Recall upon Prior Mental and Physical Conditions. *J. of Exper. Psychol.*, 1924, 7, 420–428.

This investigation was conducted with a view to discovering whether learning and recall depend upon prior mental and physical conditions. Calisthenics and multiplication-exercises were used for this purpose, and three- and four-letter monosyllabic words were used as the learning material. The words were exposed serially on a drum and for the recall the anticipation-method was used. While an analysis of the records of the graduate students used in the experiment reveals a slightly positive tendency, "the group results are unambiguously negative in character. The data indicate quite conclusively that such amounts of physical or mental work preceding learning do not influence either the ability to learn a list of words nor the ability to recall such material twenty-four hours later. Neither does such work exert any detrimental effect when it is introduced prior to the recall of material that has been previously learned under ordinary conditions." M. B. PRATT (Wellesley).

863. BROOKS, F. D., Learning in the Case of Three Dissimilar Mental Functions. *J. of Exper. Psychol.*, 1924, 7, 462–468.

This article reports an investigation in which the learning of three different kinds of tasks was studied. These tasks were: cancellation

of a's and t's, mental multiplication of three-place by two-place numbers, and inverted writing. Twenty-four students were used as subjects and were practiced 15 minutes a day for 14 days. The conclusions drawn were that "a comprehensive comparison of plateaus in the three functions cannot be made because the learning could not be continued long enough. Practice seems to preserve the ranks of the individuals in the three functions, but at the same time it makes them less alike. Identical training, instead of reducing individual differences, increases them in such amounts in the three functions that the more significant differentiation of individuals seems to be in the higher intellectual traits. Improvement is more permanent in cancellation, and least permanent in mental multiplication. A high initial score implies greater improvement in the latter, but less in the former. Improvement in cancellation implies improvement in inverted writing." M. B. PRATT (Wellesley).

864. BROWN, W., Effects of Interval on Recall. *J. of Exper. Psychol.*, 1924, **7**, 469–474.

"A list of common words was presented to be learned, and immediate recall was demanded. After intervals of eight or sixteen minutes a second recall was demanded without warning. After intervals of from three to seven days there was a third (unexpected) recall. Eighteen groups of subjects, in all 531, were employed." By the method of correlation it was found that "recitation after sixteen minutes is not much inferior to recitation after eight minutes," but "as the interval between the time of learning and subsequent recall is increased from three to seven days, there is a slight falling off in average retention." It was also found that a positive relation exists between amount learned and amount recalled, though as the interval between learning and recall increases the relation gradually falls off. The amount retained after several days (third recall) appears to be more closely related to recitation (second recall) than to the original learning (first recall). M. B. PRATT (Wellesley).

865. CARMICHAEL, R. D., The Structure of Exact Thought. *Monist*, 1924, **34**, 63–95.

The psychology of abstract thinking is illuminated by a recent experiment carried out to show that logical processes may be independent of any particular set of mental images associated with the objects of thought, and may be performed without knowledge of the concrete objects to which the postulates refer. Part of a class

construct postulates characterizing a chosen set of objects, while others determine the nature of the objects thereby. The result is a miniature mathematical science, the construction of which is an indispensable exercise to all who would understand the nature of exact thought. Exact thought is that which is involved in the construction of a doctrinal function, by which is meant, "a body of propositions made up of a consistent set of postulates and the consequences which flow from the postulates by such processes as compel assent to the conclusions reached." In spite of the common view that such a development is a mere extended tautology, it seems that actual novelties appear, so that this process is of incalculable value to philosophy and the sciences. The assumption that whatever is necessary in thought is necessary in nature is not strictly demonstrable but is a justifiable article of scientific faith. The capacity to develop doctrinal functions indefinitely, *i.e.*, achieve creative thinking, exhibits the inadequacy of every mechanistic explanation of the intellectual life of man. C. M. Diserens (Cincinnati).

7. SOCIAL FUNCTIONS OF THE INDIVIDUAL

866. Wells, F. L., Attesting Psychologists for Public Service. *Psychol. Rev.*, 1924, **31**, 328–335.

The paper is a discussion of the certification of consulting psychologists, based upon remarks at the meeting of the American Psychological Association, Madison, Wisconsin, December 27, 1923. It is desirable, in the interests of public service, to have more than one grade of consulting psychologist. P. T. Young (Illinois).

867. Hearn, J. E., The Nature of Man. *Open Court*, 1924, **38**, 54–58.

The author reviews and criticises famous definitions of human nature emanating from philosophers and biologists. He concludes that no perfect criterion has been proposed. Only man's successor will be able to define man. C. M. Diserens (Cincinnati).

868. McClelland, H. T., Mysticism and Magic. *Open Court*, 1924, **38**, 310–320.

This is a critique of a species of spurious mysticism which is now prevalent and which relies on external measures for its success. Traditional religion for example is often negative and unintelligent,

in opposing nature with artificial polities. True Mysticism is the antithesis of this attitude. The tendency to seek magical solutions for all problems leads the author to divide the world into Mystics and Vulgarians, the latter, seekers after magic formulae in all domains of life. The magical attitude is today manifested in business and politics as well as religion and philosophy. The prophylactic is a genuine mysticism; a religion involving responsibility, reverence, cosmic emotion, and exaltation. The function of religion is to secure a mystic liberation from the external Present, while the magical attitude wherever manifested, involves a constant manipulation of this external in the interest of ignoble and ephemeral purposes. The presence of a genuine mysticism in the sense described constitutes the unifying factor in all philosophy. C. M. Diserens (Cincinnati).

869. McClelland, H. T., *Open Court,* 1924, **38**, 563–573.

A study in the psychology of hypocrisy. So-called vital lies, are shown to impede rather than aid human adjustments. They represent an attitude towards experience which is both artificial and superficial and are motivated by a desire to escape from reality. C. M. Diserens (Cincinnati).

870. Christie, J. B. T., Psychology and the Communist. *Open Court,* 1924, **38**, 504–507.

A distinction may be drawn between Higher and Lower Communism. Exponents of the former have often been striking religious or intellectual leaders. Representative of the lower communism which culminates in catastrophic social changes suffer from an inferiority complex. One of this type is undeveloped, and primitive, like a child projecting his weaknesses on to others in the form of a so-called criticism of the existent social order. He compensates for his feeling of inferiority by self-assertiveness and violence. Such phenomena are exaggerated in the Mass, according to the well known laws of mob psychology. The remedies are education and sublimation. C. M. Diserens (Cincinnati).

871. Lenoir, R., Systems of Aesthetics in France. *Monist,* 1924, **34**, 380–394.

Descartes although he wrote no formal treatise on aesthetics or any special branch of aesthetics except the "Compendium Musicae," impressed upon artists and theorists the conception of a logical and

quantitative treatment of their subject matter. The attempt to apply the philosophic spirit in the fine arts developed slowly through the mediation of Cartesians or those influenced by Cartesian method. Thus according to De Crousaz (Traité du Beau) Science and Art must employ the same logical organization and the beautiful is essentially geometrical. Dubos (Reflexions critiques sur la poésie et la peinture) in the same spirit criticises contemporary art as trivial but has no positive suggestions as to the application of method. Batteux creates a distinction between the liberal and mechanical arts but insists that both are based on scientific method. In contrast Pere André gives an anti-intellectualistic orientation to reflexion on the fine arts in his "Essai sur le Beau." As a result of English influence an incoherent and eclectic attitude appears in Diderot. This promoted the growth of Romanticism which came as a reaction to logical systems of Aesthetics. Emeric David, Quatremere de Quincy and Madame de Stael express stages in this change from reflection on ideal and logical beauty to what was supposed to be life and nature. Cousin later unites all these tendencies along with German metaphysics in a new eclecticism where art is identified with the search for spiritual beauty of which nature is the symbol. Art thus becomes a privileged mode of knowledge and its theory from logical becomes mystical, a tendency which remains in Taine, Guyau, and in the Einfühlung of the Germans and the Expressionism of Croce. A positive spirit in reflection on art reappears with Darwinism and the new Criticism, but this evaporates in formal mechanism so that in spite of intentions the science of the Beautiful opens up a wider field for the Metaphysics of Beauty. Thus Cartesian reflexion on the fine arts continues to be discredited while art theory remains out of touch with humanity. C. M. Diserens (Cincinnati).

872. MacCurdy, G. G., The Field of Paleolithic Art. *Amer. Anthropol.*, 1924, **26**, 27–49.

"The paleolithic artist's range of models included both the animate and inanimate but was confined almost wholly to the fauna." Within the latter class mammals largely monopolized attention. Representations of birds and fishes are relatively rare while reptiles, invertebrates and plant forms are very infrequent. Game animals occur most frequently, the horse leading in the number of presentations. Animals seem to appear in the order of their frequency as source of food supply. Cave artists show a predilection for the female of the species doubtless because of the association with

fecundity. The artistic treatment of the human form is inferior to the treatment of animal forms. Human and animal representations are usually of the entire figure, and where parts are portrayed, phallic representations are rare. Detailed tables giving the localities, nature, and age of human and animal representations in paleolithic art, constitute the major part of the paper. Similar tables for representations of inanimate forms, such as alphabetiform signs, chevrons, frets, spirals, volutes and wave ornaments, claviform signs, darts and tectiforms, are included. In many cases these are derived by conventionalization from the animate. The author points out the limitations of the paleolithic artist due to paucity of utensils, tools, and material media. Much of the material was ready to hand and imperishable but primitive artists probably also used perishable materials, *e.g.,* wood and clay. Paleolithic artists drew to scale and exhibited considerable skill in the control of media. Much of the art was doubtless of magical rather than esthetic import. C. M. Diserens (Cincinnati).

8. SPECIAL MENTAL CONDITIONS

873. Rank, O., The Trauma of Birth in Its Importance for Psychoanalytic Therapy. *Psychoanalytic Rev.,* 1924, 11, 241–245.

This paper was read before the American Psychoanalytic Society on June 3, 1924. In it the writer sums up what he considers his personal contribution to psychoanalysis, developed in full in his recent book *"Das Trauma der Geburt und seine Bedeutung für die Psychoanalyse."* The writer found that if he set a definite time limit for the end of an analysis definite and unmistakable reactions were shown by the patient which could only be understood as a reproduction of the separation from the first libido object, the mother. The same phenomenon occurred, but was less clearly expressed, during the last phase of an analysis when no time limit was set. The end of the analysis, in other words, was producing a condition in which the trauma of birth was relived in the unconscious. In order to avoid this experience the writer proceeds in every case, regardless of sex, to analyze and reveal the mother-fixation from the very beginning. The patient's actual conflicts may then be dealt with and easily solved, and in the end he is enabled to free himself from the analyst with greater ease. The writer believes that his viewpoint extends and biologically supports Freud's concept of the neurosis; and he concludes that "The understanding of the birth

trauma practically signifies a first attempt to form the psychoanalytic therapy into a quite definite procedure having but one meaning, namely the freeing from the mother fixation and the transformation of the libido thus gained into a new well adjusted *ideal* formation based on the father identification." J. W. BRIDGES (McGill).

874. BERKELEY-HILL, O. A. R., The "Color Question" from a Psychoanalytic Standpoint. *Psychoanalytic Rev.*, 1924, 11, 246–253.

The strong "feeling-tone" that characterizes ideas on the "color question" indicates an overdetermination by unconscious factors. The herd instinct does not account for all the facts. For example, it does not explain why dark-skinned people admire the fair, and why the Australian aborigines believe that a white man is one of themselves reborn. For an explanation we must turn rather to the relation in the minds of both dark and fair skinned peoples between blackness, evil and magic. The myths and customs of all races abound in such associations. Blackness is thus associated with a primitive, nonrational fear, in the unconscious of all. In addition to this cause for the dislike of a pigmented skin, there is also another, namely, sexual jealousy, based upon the widespread belief that the negro is more potent sexually than the white man and therefore sexually attractive to white women. J. W. BRIDGES (McGill).

875. MOXON, C., Freudian Theory and Sexual Enlightenment: A Study of Resistances. *Psychoanalytic Rev.*, 1924, 11, 254–262.

This article examines the basis of the objection to sexual enlightenment of children. The desire to preserve the "innocence" of the young is due to an unconscious identification with them on the part of the objecting elders. The latter wish to enjoy by proxy the sweet illusions and blissful ignorance of life the loss of which they themselves so much regret. It is also due to the envy and jealousy of the elders directed against the sexual development and experience of children. The Garden of Eden myth is analyzed. Paradise is interpreted as the mother, and the forbidden fruit knowledge by experience. Yahweh (the jealous elder) wants to keep man in a state of sexual childishness but the snake (man's libidinous desire) tempts to a life of self-directed sexual and social activity. The psychoanalytic aim in education is to "give every person from the moment of birth the environment and education that will promote the utmost possible psychosexual growth." "Sexual curiosity is a

natural impulse in childhood; and the children's need for sex knowledge is limited only by their capacity for understanding which is indicated by their questions." Truthful answers should be given to all their inquiries in order to prevent waste of energy in repressions, useless activities, and neuroses. J. W. Bridges (McGill).

876. Sun, J. T., Symbolism in the Sumerian Written Language. *Psychoanalytic Rev.*, 1924, **11**, 263–276.

The Sumerians, a people of Ural-Altaic stock, inhabitants of the lower stretches of the Euphrates valley since about the year 6000 B.C., originated the cuneiform writing later adopted by the Assyrians and Babylonians. This writing contained less than nine hundred characters, thus compound ideograms were necessary and largely prevalent. The manner and processes of thinking of this primitive people are therefore made clearly evident by a study of their writing and its symbolism. Such a study reveals that the foreconscious intellectual processes of these ancient people were quite similar to those of the man in the street today. Extensive illustrations are given in proof of this point. J. W. Bridges (McGill).

877. Schroeder, T., Psychogenetics of One Criminal. *Psychoanalytic Rev.*, 1924, **11**, 277–291.

This is a study of the determinants of a psychoneurotic's compulsion as a professional criminal. His career lasted till at the age of thirty-six a religious conversion produced a change in life. The subject was a constitutionally inferior type of feminine appearance who suffered in early life from the tortures inflicted by a drunken father and an unintelligent bigoted mother. The one awakened in him an impulse to cruelty and the other a passionate desire to escape the restraint of rules and regulations. His criminal career was also determined by the desire to escape poverty, work and the feeling of inferiority, and to attain money, ease and gentlemanly appearance. Moreover, he identified himself with his mother, and his desire to escape poverty and work was reënforced by this identification. He was escaping his mother's destiny. His attainment of the appearance of respectability was his fulfillment of her wish for his conventional goodness, and later his conversion was probably similarly motivated. The writer concludes that much anti-social behavior could be prevented by assisting the child to a socially useful compensation for inferiority, and by a more intelligent use of punishment. J. W. Bridges (McGill).

878. Stragnell, G., The Golden Phallus. *Psychoanalytic Rev.*, 1924, **11**, 292–323.

In this article five dreams are analyzed in which the symbolism of yellow or gold occurs. In each case it was found that this color was associated with another symbol which proved on analysis to be the phallus. The life histories of three of the dreamers is given; all show a neurotic adjustment to life, wherein the dominant desire is for pleasure, sustenance or gain through the effort of someone else, after the manner of infants. Roughly the presence of the "golden phallus" symbolism in a dream denotes the desire for the father in either his usual rôle of nourisher or as a sexual object. The concept of the father, however, may represent in turn: "A tabooed love object, homo- or hetero-sexual, a powerful rival; a pattern for purposes of identification; a person of authority from whom emancipation cannot be obtained; or sustenance—bread." The writer further traces out the ramifications of the various components of this symbol as evidenced in the dreams quoted. The castration phantasy, analeroticism, homosexuality, sadism, masochism, and the prostitution complex are all involved. Masochism is given a broader basis of interpretation than has generally been conceded. It is given a nutritional as well as a sexual aspect. Thus the masochist wishes to be weak so that he may attain nourishment without work. J. W. Bridges (McGill).

879. Graven, P. S., A Series of Clinical Notes on Headache. *Psychoanalytic Rev.*, 1924, **11**, 324–328.

Eight cases are presented in which headaches were investigated by the psychoanalytic method and found to be psychogenic in origin. In every case the analysis was followed by the disappearance of the symptom. J. W. Bridges (McGill).

880. Wedge, S. T., *The Psychology of Dreams. Open Court*, 1924, **38**, 84–92.

Dreams are a source of perennial interest to mankind. Their comprehension demands a knowledge of the nature of mind and its functions. There seems to exist, conscious, subconscious, and unconscious spheres, each being a field for the exercise of distinct functions. Mental data come entirely from the external world, but the elaboration varies according to the sphere in which it takes place. Controlled, intelligently directed elaboration occurs in full consciousness. Dreams represent uncontrolled elaboration of experience

through the activity of the imagination working in the sphere of the unconscious, where a wider range of data is available. Such dream material includes emotional elements, and there is constant interaction between the processes of conscious, subconscious, and unconscious mind. C. M. Diserens (Cincinnati).

9. NERVOUS AND MENTAL DISORDERS

881. Cowie, D. M., Parsons, J. P., and Raphael, T., Insulin and Mental Depression. *Arch. Neurol. and Psychiat.*, 1924, **5**, 522–533.

"The characteristic glucose utilization curve of the depressed phase in manic-depressive psychosis is made to conform to that of a normal person or is completely flattened out, or is made to approximate that of the agitational phase by the subcutaneous injection of insulin. The amount of insulin necessary to accomplish this varies with the clinical status of the patient. There seems to be evidence that the degree of depression may be measured by the amount of insulin necessary to bring the glucose utilization curve to that of a normal person. The amount of insulin necessary to bring the curve to normal is a measure of the factors opposing the utilization of glucose." W. P. McElroy (Boston Psychopathic Hospital).

882. Stevenson, G. S., Cardiovascular Physiology of the Mental Defective. *Arch. Neurol. and Psychiat.*, 1924, **5**, 507–517.

Reports and observations which were made on thirty-seven low grade and thirty-six high grade male cases. The cases were selected within the age limits of twenty to twenty-five years, and twenty-five to thirty years. Within each of these year groups were the two groups of high and low grade cases. Three sets of observations were recorded: (A) Circulatory Efficiency Tests, in which pulse rates at reclining and at standing were compared. (B) Cardiac Reserve Tests, in which were recorded and compared (1) initial systolic blood pressure with patient at rest, (2) standard dumb-bell exercise, (3) immediate rapidly recorded successive readings of blood pressure for two minutes and again at three minutes. (C) Vegetative Sensitivity Tests, in which the effects of three drugs—suprarenal extract, atropin, and pilocarpin—were observed. "There are certain indications that the feebleminded of the low grade have reacted like untrained persons when compared with those of higher grade. . . .

Furthermore, the feebleminded person probably spends himself sooner. The falling off in correlation between original pulse and exercise pulse in the low grade group may mean that previous responses have raised the pulse so near its maximum that the pulse which responds to exercise has no leeway to assume its normal relations to the preëxisting pulse, hence loses correlation with it. . . . The greater fall in the standing blood pressure of the low grade group is indicative of relative inefficiency. . . . We may seriously consider whether the term 'no guts' may not in part mean a lack of splanchnic tone to keep the pressure even and the blood well distributed. It is a question whether mental age alone gives a close biological classification here. Had it been possible also to grade and to rate the emotional balance and industrial efficiency, an even more satisfactory comparison between the groups would have resulted. The psychophysical inferiorities of the feebleminded are probably not merely dependent on a defective or insufficient cerebral impulse, but there is as well a paralleling inferiority in the integrations of the vegetative nervous system. To this we may attribute the instability of circulatory response of the feebleminded." W. P. McElroy (Boston Psychopathic Hospital).

883. Adson, A. W., The Surgical Treatment of Glossopharyngeal Neuralgia. *Arch. Neurol. and Psychiat.*, 1924, 5, 487–506.

A description of extracranial and intracranial operations for the relief of glossopharyngeal neuralgia. Four cases are reported. "Glossopharyngeal neuralgia is a disease with a definite entity, similar to trifacial neuralgia in its course, and probably having its origin in the superior ganglion of the glossopharyngeal nerve; it can be relieved temporarily, and possibly permanently, by an extracranial avulsion of the glossopharyngeal nerve and part of the ganglion, but division of the root intracranially should afford a permanent cure, which procedure I would advise since the technic is no more formidable than an extracranial avulsion." W. P. McElroy (Boston Psychopathic Hospital).

884. Young, A. W., and Alpers, B. J., The Protein and Cellular Content of the Cerebrospinal Fluid. *Arch. Neurol. and Psychiat.*, 1924, 5, 537–546.

"A study of the cellular and protein contents of the cerebrospinal fluid is presented in twenty-five cases in which intraspinal therapy was used with Swift-Ellis serum, in twenty-one cases in which the

intracistern route was used, and in five cases in which intraventricular treatment was given. After the intraspinal injection of Swift-Ellis serum in the lumbar region, there occurs a marked rise in the cells and the total protein of the lumbar fluid after twenty-four hours, which is still present after forty-eight hours, and has disappeared at the end of six or seven days. A similar rise in the cells and the total protein of the lumbar spinal fluid is observed after the injection of Swift-Ellis serum by the cisternal and ventricular routes. A moderate rise in the cells and the total protein of the cisternal fluid is observed twenty-four hours after the injection of Swift-Ellis serum by the lumbar route. This increase disappears at the end of forty-eight hours. There is no increase in the cells and the total protein of the ventricular fluid twenty-four hours after the injection of Swift-Ellis serum into the lumbar region. The increase in cells—which are chiefly polymorphonuclear leukocytes—is due to the irritative action of the serum on the meninges." W. P. McElroy (Boston Psychopathic Hospital).

885. Gregg, D., The Prognostic Value of Arterial Hypertension in the Psychoses of Later Life. *Arch. Neurol. and Psychiat.*, 1924, **5**, 534–536.

"From such a limited number of cases (27), inferences can be made, but no conclusions drawn. So far as the evidence herewith presented is concerned, it seems that the prognosis of the psychoses of the later years is poor if hypertension is present to complicate the situation, but good if hypertension is not found." W. P. McElroy (Boston Psychopathic Hospital).

886. Farr, C. B., Results of Basal Metabolism Tests in One Hundred Mental Cases. *Arch. Neurol. and Psychiat.*, 1924, **5**, 518–521.

"These findings suggest some endocrine imbalance in dementia praecox, but our not very extensive therapeutic trials have shown no definite improvement after thyroid extract and thyroxin. Innation and physical inactivity have not been shown to be important factors. While basal metabolism estimations have so far not proved very informing, it seems to me that they should be continued, preferably in combination with other vital function studies, as a guide to experimental endocrine therapy." W. P. McElroy (Boston Psychopathic Hospital).

887. Strecker, E. A., and Ebaugh, F. G., Neuropsychiatric Sequelae of Cerebral Trauma in Children. *Arch. Neurol. and Psychiat.*, 1924, **4**, 443–453.

This is a study of twenty-three boys and seven girls, ranging in age from three to sixteen years. The cases are discussed from the three angles, physical sequelae, post-traumatic behavior, and psychological findings. The histories, findings, diagnoses, and present status of the cases are presented in a condensed form. Attention is directed to the similarity of these cases to post-encephalitic behavior disorders and the contrast to adult traumatic sequelae; also their relationship to problems of delinquency. "There are few statements in the literature concerning the prognosis. . . . In our group we can only state conservatively that six are improving, whereas the outlook in the remaining twenty-four is discouraging. . . . Treatment consists in careful surgical management during the acute manifestations of cerebral trauma. Rest from physical and mental exertion, removal to a quiet, nonirritating environment, intensive study in mental hospitals, more individual consideration in school, special classes and vocational guidance, are all matters of importance in treatment. During periods of mental excitement, we find that drugs are of little avail, but hydrotherapy is often helpful." W. P. McElroy (Boston Psychopathic Hospital).

888. Locke, C. E., and Naffziger, H. C., The Cerebral Subarachnoid System. *Arch. Neurol. and Psychiat.*, 1924, **4**, 419–442.

This is a study of consecutive admissions of men to the Manhattan State Hospital from July 1, 1911, to June 30, 1913. "The study comprises 1,004 consecutively admitted male general paralytic patients. Approximately one-third of the patients had remissions lasting one and one-half years or less; one-half had remissions lasting three and one-half years or less; and one-half had remissions lasting four years or more. From this study it may be concluded that spontaneous remissions in patients with untreated cases of general paralysis occur but are not frequent; that in at least more than one-half of the cases they are not permanent; that remissions may occur more than once in the course of the disease in the same person; that remissions are more common in cases presenting a gradual onset, with changes in the disposition, emotional instability and defects in orientation and memory than in other clinical types of general

paralysis; that there are no anamnestic, mental or neurologic criteria on which a prognosis for a remission can be based; that factors favorable to the occurrence of spontaneous remissions must be sought elsewhere than in the clinical picture of the disease; that the Jews, Irish and Germans are relatively more prone to develop general paralysis than other races; that the incidence of spontaneous remissions in Jews, Germans and Italians is low as compared with that of other races." W. P. McElroy (Boston Psychopathic Hospital).

889. Jelliffe, S. E., Parts of Central Nervous System which Tend to Exhibit Morbid Recessive or Dominant Characters. *Arch. Neurol. and Psychiat.*, 1924, **4**, 380–410.

The writer states that his point of view is functional rather than simply anatomical. In discussing heredity and development he presents Stockard's analysis, also the groupings of Jendrassik, of Lönde, and of Bielschowsky. Bowers' program for research on multiple sclerosis is presented. "So far as our particular issue may be outlined, the work of the comparative anatomist, as well as of the embryologist, has indicated phylogenetic and ontogenetic modes of approach which may be followed to advantage." The latter half of this paper is concerned with the relation of heredity to various mental disorders. W. P. McElroy (Boston Psychopathic Hospital).

890. Trentzsch, P. J., The Objective Findings in the Psychoses. *Arch. Neurol. and Psychiat.*, 1924, **4**, 370–379.

"In 601 necropsies in cases of the hebephrenic and catatonic types of dementia praecox, 71.55 per cent were found to have small aplastic hearts. The incomplete development involved also the capillary system. In a study of the weight of the heart in psychoses, 75.5 per cent of the patients with dementia praecox had hearts of less than average weight, while only 7.8 per cent of the patients with paranoia had hearts of less than average weight; 30 per cent of the patients with manic-depressive psychosis and 30.2 per cent with epilepsy had hearts weighing less than the average. . . . In conclusion, we would state that if the foregoing figures are correct, it would seem that in the neurocirculatory rating one has a definite objective symptom of the psychoses, and this suggests a physical reason for mental illness as well as those that are psychic. It is not advisable to ignore either one." W. P. McElroy (Boston Psychopathic Hospital).

891. Furman, I. J., Treatment of General Paralysis; Results Obtained in a Series of Five Hundred Cases. *Arch. Neurol. and Psychiat.*, 1924, 4, 359–369.

"From the work done at the Manhattan State Hospital, we feel that the most outstanding results of treatment of paralysis so far is the improvement in the general health of the patients. This is shown by the fact that fewer are confined to bed, that a greater number are paroled for a longer period and remain out of the hospital until the expiration of their parole, and that there are more true remissions." W. P. McElroy (Boston Psychopathic Hospital).

10. INDIVIDUAL, RACIAL AND SOCIAL PSYCHOLOGY

892. Thorburn, J. M., Analytic Psychology and Religious Symbolism. *Monist*, 1924, 34, 96–111.

Religion is incapable of attenuation into the merely ethical. The essence of religion is locked up in its symbols which, until the advent of psychoanalysis were misunderstood, and rejected as valueless. Hence neither rationalistic critics nor dogmatic defenders have thrown any real light on the subject. The first step toward a genuine explanation is due to Freud who shows that the "incest motive" and its variants such as the "rebirth motive" are the fundamental elements of religious myths. Freud does not indicate whether such explanation deprives myths of religious value. The latter task fell to Jung, who in his *"Psychology of the Unconscious"* shows that such transformations of the incest motive: (1) serve as an outlet for dangerous surplus energy, and (2) create social and esthetic values. In his work on *"Psychological Types"* Jung pursues the subject further, introducing ideas of teleology to supplement the principle of causal determination which has sufficed up to this point in analyzing the transformations of the libido. This is important since no science can proceed without ultimate reference to teleological categories. Perception of the teleological element in phantasy formations opens the way to a fresh recognition of the value of religious symbolism as a creative factor in the life of the race. It completes and justifies the process whereby the modern world has arrived at the conception of the relativity and subjectivity of God. Jung presents the point of view of Hindu and German mystics as well as that of Kant, in a new synthesis characterized by the thoroughness with which the metaphysical issue of the psychological problem is investigated. C. M. Diserens (Cincinnati).

893. Boas, F., The Social Organization of the Tribes of the North Pacific Coast. *Amer. Anthropol.*, 1924, **26**, 322–332.

A study of the forms of social organization found among the coast tribes of Alaska and British Columbia raises fundamental questions regarding the theory of social development. Professor Boas finds that "as we go northward, the idea of the unity of the village community becomes increasingly associated with privileges described as crests. With the Bella Bella this system is overlaid with a system of clans identical in name with the clans of the northern matrilineal tribes, a result due to historical connections. The clans are functionless compared with village communities but involve the idea of maternal descent, which is, however, contrary to the linguistic forms of these tribes. Farther north, emphasis on the village community persists, but the community is subordinated to the exogamic clan, and the position of the individual is fixed with relation to both clan and local unit. Following the clan system southward, exogamy gradually vanishes, endogamy sometimes appearing, while local units grow increasingly independent of the fading clan system. Professor Boas adds special notes on the characteristic traits of political and religious organization among the Bella Bella. Tribes are divided into four classes, the organization being partly determined by the organization of the tribes during the Winter Ceremonial. Much complexity has arisen in the latter, through confusion of family with general tribal ceremonial. C. M. Diserens (Cincinnati).

894. Parsons, E. C., Tewa Kin, Clan, and Moiety. *Amer. Anthropol.*, 1924, **26**, 333–339.

This is a study by the comparative method, of Tewa kinship terminology, and the principles of classification upon which it is based. Respecting the latter, there is little merging of direct and collateral kin, and there is emphasis on the principle of seniority to the exclusion of sex. There is much borrowing of terms irrespective of language, and differentiations occur from town to town. Tewa kinship terms are less expressive of clanship than in other Pueblo terminologies except that of Taos, but the relationship is never sharply defined. Kinship terms are never used as clan terms as some Tewa are unaware of the existence of clans or their clan status. The moiety system is a substitute for clans in the social consciousness. Moieties exist for ceremonial purposes, involve the concept of descent, and are associated with certain ideas of summer and winter. Moieties tend to be endogamous, though the strength of this tendency

varies from community to community. The distribution of houses is sometimes according to moieties. Tabular descriptions of clans and moieties with their affiliations and associations are included. C. M. DISERENS (Cincinnati).

895. RADIN, P., Ojibwa Ethmological Chitchat. *Amer. Anthropol.*, 1924, **26**, 491–530.

An attempt to obtain personal reminiscences from certain older individuals among the Eastern Ojibwa of Ontario resulted in the collection of 91 items of what might be termed primitive gossip. Incapable perhaps of writing autobiographical accounts, the two Indians approached furnished materials of a fragmentary nature, embodying much ethnological information otherwise difficult to obtain. The results are both intrinsically interesting and ethnologically valuable, affording as they do an intimate picture of Ojibwa village life of 100 years ago. Although religion and ceremonialism are avoided, emotions, humor, and beliefs concerning the relation of Man to the animal and spirit worlds, are well represented. The items include references to such diverse subjects as fasts, dreams, phantoms, thunder and water spirits, conjuring, magic, magical garments, and mysterious animals, the medicine man (Mide) and the origin of medicine songs, primitive meteorological and geological observations, hunting adventures, and the belief in the transformation of men into animals and vice versa. Some of the stories are rather meaningless while others throw a strong light on Indian character. C. M. DISERENS (Cincinnati).

896. SULLIVAN, L. R., Race Types in Polynesia. *Amer. Anthropol.*, 1924, **26**, 22–26.

The Polynesians are not a uniform racial type. The " Polynesian type " is an abstract concept embodying the characteristics of several distinct physical types. Evidence of physical changes, *e.g.*, increasing brachycephaly and stature, variation in nasal index, etc., appear upon comparison of the living with skeletal remains. Mongoloid, Negroid, and two types of Caucasoid elements may be definitely distinguished, but cannot be named until more is known of their specific racial relationships. The old view that these types may be explained by local differentiation must be abandoned. C. M. DISERENS (Cincinnati).

897. Swanton, J. R., Three Factors in Primitive Religion. *Amer. Anthropol.*, 1924, **26**, 358–365.

That peoples in every age and stage of culture have associated religious beliefs with the more startling or mysterious phenomena of nature is evident, but it does not follow that there is a causal connection between the two, as such prominent anthropologists as Tylor, Marett, Read, and Levy Bruhl seem to think. Primitive religion can not be attached to a few objects, phenomena, or emotions to the exclusion of others. Such phenomena rather excite a particular religious interest specialized out of a general religious attitude which is a primary human factor not traceable to a specific origin. Failure to recognize this fact is an example of the particularistic error in anthropology, another phase of which appears in the assumption that the various elements in the religious complex were introduced at successive periods. The elements of the religious complex should rather be regarded as simultaneous manifestations of the religious sentiment showing greater differentiation here and more specialization there but properly a unit. Hence endeavors to develop all religion from a single element of a complex must rely at best on incomplete evidence. Monotheism is more primitive than is commonly assumed and even its more esoteric side presupposes less mental advance than has been held necessary. A third point of criticism is the indefinite use of the term, animism, while Marett's term "animatism" is even more indefinite. Apart from magic, the objects exciting the religious emotions of primitive man, always contain a human element. Apparent objects of worship are generally the seat of anthropomorphic incarnations. C. M. Diserens (Cincinnati).

898. Green, L. C., and Beckwith, M. W., Hawaiian Customs and Beliefs Relating to Birth and Infancy. *Amer. Anthropol.*, 1924, **26**, 130–146.

An account of the folklore connected with pregnancy, the phenomena of birth, nutrition, naming, infanticide, and adoption, with native interpretations. For example: The desires of an expectant mother particularly with respect to food, are supposed to determine the dispositions, activities and physical stigmata of her child. Births of commoners are presaged by the cries of birds; of chiefs by signs in the sky. Birthmarks are indications of a child's nature after birth and navel cords possess magical properties and are carefully disposed of. Cutting the hair is unlucky. Children are named after

relatives or to commemorate striking events. Sometimes offensive names are given to keep off evil spirits. Secret names are sometimes revealed in a dream by the gods and such names insure good luck. Elaborate ceremonies attend various stages in the nutritive life of the infant. Infanticide was formerly practised by the aristocracy as a means of preserving rank; by commoners to avoid work. Adoption was practised by the common people to avoid labor of rearing children or as a supposed protection for the child where parents had lost other children. C. M. DISERENS (Cincinnati).

899. PARSONS, E. C., The Scalp Ceremonial of Zuni. *Mem. Amer. Anthropol. Assn.*, 1924, **31**, 42.

The Pueblo Indians are a relatively peaceful people and such war organizations as exist, now function as a defense against invasive custom and witchcraft. Communal well being is still regarded as absolutely dependent on maintenance of ancient ceremonial. A very important ceremonial centers about scalp taking, the object being to initiate dead enemies into the group, in order that their powers may contribute to rainmaking which is the most important consideration among these people. The scalp ceremonial which Dr. Parsons describes in detail is an eleven-day affair with the twofold object of initiating and propitiating the dead. It further gives publicity and power to the military hierarchy. Accounts of the ceremonies as communicated to, and partially witnessed by the author in 1921, are compared with Stevenson's description of 1891, and yield interesting data on the dynamics of ceremonial change. Factors of change are: (1) The substitution of one group for another in carrying out the ceremonial. (2) Decline in popular interest. (3) The destruction or disappearance of sacerdotal paraphernalia. Several myths are given which throw light on the psychological attitude behind the ceremonies. Intermingled with accounts of the nature and sequence of ablutions, fetiches, dances, taboos, etc., are examples of primitive rationalizations. The monograph is illustrated with drawings of paraphernalia, photographs of typical scenes, and diagrams showing the positions of participants at various stages of the ceremonial. C. M. DISERENS (Cincinnati).

900. MALCOLM, L. W. G., Sex Ratio in African Peoples. *Amer. Anthropol.*, 1924, **26**, 454–473.

This is a study of (a) the extent and distribution of sex ratios of African tribes and (b) the relationship of such ratios to racial decline

or otherwise. The second problem remains unsettled. Ratios are calculated with regard to tribal distribution or known district. Primary, secondary and tertiary sex ratios are distinguished depending on whether conceptions, births, or adult individuals are compared. The results are stated in tabular form not permitting a summary. The contributions of other ethnologists to the problems involved are discussed at some length. Thus the effects of miscegenation on sex ratio is undetermined. Sex ratios are influenced by intrauterine mortality. Sex ratio seems lower in colored than in white races. The secondary sex ratio (of birth) is not invariably constant within an ethnic group. The relation of sex ratio to polygamy and monogamy is uncertain. A progressive surplusage of adult men over adult women in a group seems correlated with decline in the crude population and inversely. Interpretative remarks by A. S. Parkes are incorporated in the paper which includes an excellent bibliography of 66 items. C. M. Diserens (Cincinnati).

901. Shattuck, L. A., Patriotism. *Open Court,* 1924, **38**, 206–234.

Patriotism is psychologically a sentiment which offers a maximum of emotional resistance to criticism; biologically a mechanism of survival; while politically it is the categorical imperative of the state's metaphysics. As a political mechanism, patriotism becomes if anything more effective in democracies where density of population, leveling of mental capacity, enhancement of suggestion, and facility of propaganda, enforce its authority in a way impossible to ancient society. Yet certain elementary impulses remain basic, viz., hero worship, herd instinct, and acquisitiveness, to which political organization and the establishment of conditions for the operation of the more complex impulse of patriotism, may be ultimately traced. The author also analyzes the mutual relations of state and individual and suggests the relative efficiency of various forms of polity, finding the special weakness of democracy in an inherent tendency to a multiplicity of laws which can not be rigidly enforced. C. M. Diserens (Cincinnati).

902. Boas, F., Evolution or Diffusion. *Amer. Anthropol.,* 1924, **26**, 340–344.

Recent anthropological work indicates that in geographically extreme areas, distinctive types of cultural prenomena occur, intermediate regions showing transitional types. This is true of social organization, folklore, material culture and artistic styles. The

occurrence of intermediate forms is evidence of diffusion, while a theory of uniform development is difficult to maintain. The assumption of a unique form of cultural beginnings does not seem plausible, but a survey of cultural phenomena points to a diversity of early patterns which spread and mingle, giving rise to new types in intermediate areas. C. M. Diserens (Cincinnati).

903. Loeb, E. M., The Schaman of Niue. *Amer. Anthropol.*, 1924, **26**, 393–402.

The priests (taula atua) of Niue differ from other Polynesian priests in that there is no specialization of function, each performing all the functions of his profession, viz., bewitching, curing, prophesying, and cursing enemies. They are therefore to be classed as Schamans. In bewitching, the victim must know of impending doom in order for spells to be effective. Priests or Schamans were regarded as possessed by the gods or ghosts, hence as infallible prophets of weather. They were of usually unstable mentality, epileptics or temporarily insane, the office consequently running in families. They were of both sexes. There was little conscious imposture or resort to artificial means of inducing delusions. A chief cause of disease was supposed to be loss of one's soul which the schaman undertook to recover by communicating with the gods while in a trance. They claim to see and receive information from ghosts. An important function is that of prophesying the results of conflicts, and paralyzing the enemy by the ceremony of passing spears through the smoke of a fire. Details are given concerning modern schamans, some of whom appear to be of quite normal mentality but actuated by mercenary motives, while others represent cases of intermittent insanity. Schamans were never regarded with awe except when in a fit, insanity in contrast with feeblemindedness, still evoking respect among the islanders. C. M. Diserens (Cincinnati).

904. Macleod, W. C., Natchez Political Evolution. *Amer. Anthropol.*, 1924, **26**, 201–229.

Natchez political organization deserves careful study, because the cultures of the southeastern coasts of North America are extinct, and with the exception of the Natchez, materials for the study of this type of culture are scanty. Moreover, Natchez culture is unique and in certain details of politics-racial organization approaches Old World types throwing light on the problem of convergent evolution versus diffusion. The Natchez are a Mississippi tribe of probably Floridian

origin. State offices were prerogatives of members of the matrilineal royal family denominated as "Suns." There is a civil stratification of population in which the superior classes including in order, "Suns" or Royal family, Nobles, and "honored men" are contrasted with commoners known as "stinkards." Rank in this civic scale was not permanent, however, the next generation of any of the superior classes descending one step in the scale until they became commoners, this happening in the fourth generation in the case of descendants of male "Suns." This descent in the scale was due to the rule of exogamy within the noble groups. Commoners on the other hand, through personal prowess might ascend the scale or by offering themselves for morturary sacrifice they might elevate their immediate family. The psychic causes of this kind of organization are traced to matrilineal descent and the firm establishment of exogamy. Mortuary practices such as the sacrifice of wives at the death of husbands prevented women of the noble classes uniting with men of the same rank, and thus establishing an endogamous and self-perpetuating nobility. Interesting comparisons are made between certain Natchez culture features and similar ones of West Africa. C. M. Diserens (Cincinnati).

905. Herskovits, M., Some Property Concepts and Marriage Customs of the Vandau. *Amer. Anthropol.*, 1923, **25**, 376–386.

The Vandau are a tribe of Portuguese West Africa. The data for the study were obtained from a native studying at Columbia University. Chieftainships and subchieftainships are hereditary but headships of kraals are not. Property rights are well established and an individual may claim as much land as he cultivates or intends to cultivate. Land sales are unknown and deserted land reverts to the public. Everything is privately owned, communism being absent. Trespass is punishable by beating, but if an owner kills the trespasser he must pay blood money or work for the victim's family as compensation. The sexes enjoy equal property rights but as a general rule, "members of each sex own those things with which they are most concerned." Inheritance is in the male line, the eldest son inheriting most, while none are unremembered. Disputes are submitted to regularly constituted native courts and evidence is required for conviction. Religious sanctions enhance the power of the courts. In arranging marriages parental authority is considerable, but coercion is rare, since this would menace family solidarity which is greatly prized. The number of wives a man has depends upon his wealth,

and is a factor in increasing the latter. A plurality is thought honorable because of the prestige it confers. C. M. DISERENS (Cincinnati).

906. WATERMAN, T. T., The Subdivisions of the Human Race and Their Distribution. *Amer. Anthropol.*, 1924, 26, 474–490.

Few things are more conspicuous than racial differences, but which are hereditary, which are due to geographical influences, and which are simply the expressions of slowly developed group ideas or convictions or habits, has never been determined. Most differences appear to be in training or culture, though some are inborn. We may distinguish three great racial groups, the White and Yellow occupying the central land area toward the north called by the author, Holarctica, and the Black in the peripheral regions of the south. The reasons for this distribution appear to be that the Negro is an earlier, more primitive, and probably inferior human type which has been pressed to the south by the more advanced Mongolian and Caucasian groups which are apparently of equal endowment. Mongolian and Negro are definitely characterized groups while the White man is extremely variable, being possibly some blend of the other two. The Negro, however, seems to be a definitely inferior and vanishing group, while the other two are maintaining themselves upon an equal footing. Within the Mongolian group the Malay division is at present advancing to what may prove a dominant position. C. M. DISERENS (Cincinnati).

907. BARNES, H. E., Theories of the Origin of the State in Classical Philosophy. *Monist*, 1924, 34, 15–62.

This is a résumé of theories of the origin of the state in ancient and early medieval times with special emphasis on the question of early terminology. The concepts of society, state and government were not sharply defined until comparatively recent times and are still often used with a certain vagueness. No definite theories regarding the state existed in Homeric days but mere descriptions of semi-tribal, semi-feudal conditions are offered. Socrates failed to develop systematic theories on the subject but introduced the conception of a law of nature as contrasted with human laws thus opening up a fertile field of political speculation. Plato gave a picture of an ideal industrial society tracing the origin of society or the state which are identified, to the instinct of sympathy working in the presence of geographic economic and political factors. In the laws he stresses the rôle of evolution and the antiquity of man. Subjectively the basis of

the state is justice which is founded on the social division of labor. Aristotle begins to distinguish between state and society, finding their subjective basis in friendship and gregariousness. The Stoics traced the origin of the state to natural law, social instinct and an ethical imperative or rational perception of man's relation to his fellows. The Epicureans for the first time assign the origin of the state to a social compact on the part of the components of society. Polybius like Aristotle defines and classifies various types of government and describes the cycle of their appearance. Lucretius ascribes the origin of the state to a social compact for mutual protection after a period of anarchy, following an epoch of kings. Cicero combines the views of his predecessors and stresses the factor of like mindedness. Seneca and the Patristic Fathers view the state as a product of human depravity and regard government as having a divine source. C. M. Diserens (Cincinnati).

11. MENTAL DEVELOPMENT IN MAN

908. Fukuda, T., A Survey of the Intelligence and Environment of School Children. *Amer. J. of Psychol.*, 1925, **36**, 124–139.

A survey of the intelligence of the children in a school of 257 by the Terman Revision of the Binet Simon Test shows a slightly higher average I.Q. for the English speaking than for the non-English speaking class. Children whose parents are engaged in so-called brain and skilled work rate higher than those whose parents are of other occupations. There is a difference of 13 per cent in the average I.Q. business and office work and unskilled labor, and a difference of 5 per cent between skilled labor and unskilled labor. The English speaking people are engaged more in "brain and skilled" work and less in unskilled labor than the non-English speaking class. They also rank higher on a rating of the child's environment. Ratings of environment correlate .53 with intelligence quotients. Intelligence, nationality and environment appear to be closely related. G. J. Rich (Chicago, Ill.).

909. Thorndike, E. L., Measurement of Intelligence. *Psychol. Rev.*, 1924, **31**, 219–252.

Three kinds of defect in modern intelligence tests are noted: (1) The content of the tests is ambiguous; a variety of tasks are set. (2) The units of measure are arbitrary. The lack of a zero point

of intelligence and also the age basis are not satisfactory. (3) The significance of intelligence tests is ambiguous. Since there is no generally accepted criterion of intellect it is impossible to say what the tests measure. In positive reconstruction it is noted that the intelligence tests measure intellectual products and that measures of intelligence imply evaluation. Three criteria for evaluating the tests are considered: truth-getting; development with age; ability to learn. Other attempts to evaluate the tests have been made on the basis of response to novelty and relational thinking. The materials of tests have been limited, but there is no reason why tests should not draw upon any kind of material. The form of intelligence tests should be flexible and a wide range of operations should be covered. As regards scoring we must come to some objective basis of difficulty. An empirical means of defining difficulty is suggested (244). Intelligence tests should distinguish level, extent and speed of intellect. Three theorems and two charts are presented. P. T. YOUNG (Illinois).

910. GILCHRIST, O. B., A New View of Mental Development. *Psychol. Rev.*, 1924, **31**, 297–310.

The *Gestalt* psychology as represented by Koffka and Köhler has given us a new view of mental development, a view consistent with the facts of infant psychology. The viewpoint marks an advance from the work of Watson, Thorndike and other students of animal behavior. The mechanistic theory of behavior is unsatisfactory; the *Gestalt* theory offers a more adequate basis for interpretation. Such men as Stout and McDougall, independent of the *Gestalt* psychology, have evolved hypotheses akin to it. P. T. YOUNG (Illinois).

911. LAIRD, D. A., and REMMERS, H., A Study of Estimates on Intelligence from Photographs. *J. of Exper. Psychol.*, 1924, 7, 429–445.

The authors used a set of ten photographs of students who had been given a standard intelligence test. Three hundred and seventy-six subjects, persons of all sorts, were asked to arrange them in order of intelligence. Over half of these persons had been tested themselves so that it was possible to discover how their judgments correlated with their intelligence. The results show that the average of judgments is no better than luck; that intelligence on the part of those judging makes no difference; and that even if a judge does well on the first trial he is likely to do badly in arranging another

set of pictures. Sets of two pictures each were also used, and here again it was also found that the judgments were merely a matter of luck. The same thing held true of persons working together, and of a professional "character reader." M. B. PRATT (Wellesley).

912. SYMONDS, P. M., On the Loss of Reliability in Ratings Due to Coarseness of the Scale. *J. of Exper. Psychol.*, 1924, **7**, 456–461.

After a discussion of the various ways in which scales may be constructed, the writer concludes that "for rating traits of personality the optimum number of class intervals is 7. Rating with a scale of more than this number of classes demands a discrimination which does not yield an increase in reliability sufficiently great to make the increase worth while according to an arbitrary definition of such worthwhileness. Likewise, according to our definition, a rating scale with a fewer number of classes suffers from a loss of reliability greater than is allowed, due to coarseness of grouping. The graphic rating scale, although permitting as close a discrimination as possible, contributes but little to increased reliability over a 7-point scale. Group mental and scholastic tests which cover a range of score of a hundred or more points give an illusory impression of discrimination." M. B. PRATT (Wellesley).

913. GATES, A. I., A Critique of Methods of Estimating and Measuring the Transfer of Training. *J. Educ. Psychol.*, 1924, **15**, 545–558.

The transfer of reading ability furnished the subject matter for this work, the main object of which was to examine the "control group method" of studying transfer. Results obtained experimentally were compared with the estimates of experts, and with conclusions based on multiple correlations of factors in a first performance in order to find the reliability of the later two methods. Gates found the customary control group method unsatisfactory, "since it is probable that ability to take tests generally makes the total transfer larger than that due to gain in subject matter *per se*." He suggests that in the future tests be scrutinized as not merely measures of one thing but of various abilities; to perceive words or digits, to adjust to a certain kind of task-under-time-pressure, to control attention, to write words or figures in such and such a way, and so forth. In judgment, experts in psychology were found able to estimate relative amounts of transfer to different described functions, but were

unable to appraise accurately absolute magnitudes. It was found possible by means of partial correlations to estimate roughly the relative amounts of transfer. J. D. WEINLAND (Lehigh).

914. HAGGERTY, H. E., and NASH, H. B., Mental Capacity of Children and Parental Occupation. *J. Educ. Psychol.*, 1924, **15**, 559–572.

This study is placed in its proper perspective by recalling the intelligence differences between occupational groups in the army. Here intelligence differences in New York rural schools between children from different occupational groups are shown. The measure was Haggerty Intelligence Examination, Delta 2. No attempt is made to attribute differences to heredity or environment, a simple statement of fact being given with the suggestion that its educational significance should be noted. It has previously been shown that success in intelligence tests argues probable success in school; this investigation shows success in intelligence tests to be directly related to the occupations of the fathers. The children of professional fathers can master the present curriculum, the children of artisan fathers are much less likely to succeed. That the latter are entitled to a modification of present educational procedures to facilitate their progress through school is a possible inference from this data. J. D. WEINLAND (Lehigh).

915. ENGLEHARDT, J. L., A Test of Physical Efficiency. *J. Educ. Pschol.*, 1924, **15**, 573–577.

This test is based on the one originated by D. A. Sargent and discussed in *Sch. and Soc.*, **13**, 125, under the title, "The Physical Test of a Man." Englehardt modified Sargent's test, and as he uses it it consists of a series of vertical jumps repeated as rapidly as possible for fifteen seconds. This test is found to be not affected by previous training in general athletics, and is thought to measure the "unknown quality;—vim, vitality, or driving power." A mechanism was devised for accurate measurement. With university boys a correlation of 79 was found between this test and qualified judgments of physical efficiency. Used in correlation with mental abilities the test would indicate little relationship between physical and mental efficiency. J. D. WEINLAND (Lehigh).

916. Wager, R. E., Fixation-Accommodation Rates as Factors in Reading. *J. Educ. Psychol.*, 1924, **15**, 579–587.

The data, previously secured, and the apparatus used is described by Wager in the *J. Educ. Psychol.*, 1922, **13**, 561. The conclusion reached in the present paper is that motor reaction times are to be regarded as significant factors in reading rates. So regarded, speed in reading is not to be considered as determined alone by habit, or attention span, but rather by a complexity of factors of which fixation-accommodation time is important. It is not inferred from this work that faster rhythm and wider span cannot be developed, but that native physiological limits are placed upon each individual, setting bounds to the maximum rate at which he may make the necessary muscular adjustments involved in quick reading. J. D. Weinland (Lehigh).

917. Neifeld, M. R., Formulas for Facilitating the Computation of the Mean of the Distribution Obtained by Combining Component Distributions. *J. Educ. Psychol.*, 1924, **15**, 588–591.

The formulas presented enable one to predict the amount of change in the mean of a distribution when one or more component series are either subtracted from or added to the entire distribution. They simplify the arithmetic by reducing the size of the numbers used in the calculations since distributions expressed in percentages can be used in the formulas in substitution for the actual numbers. The mean of a combined distribution is found equal "to the means of one of the component distributions increased by the algebraic quantity obtained by dividing the difference of the means of the two component distributions by the ratio of the populations of the two component distributions increased by unity." J. D. Weinland (Lehigh).

918. Reed, H. B., A Further Note on the Whole and Part Method. *J. Educ. Psychol.*, 1924, **15**, 592–595.

The value of the "Whole Method" in learning is here seriously questioned and the experimental data leading to its promulgation, reviewed. Reed calls attention to the fact that the Saving Method of measurement cannot be used to settle the "Whole or Part" controversy because it depends on the relative differences between the times compared, and ignores the amount of work per unit of time. To quote: "If we base our judgments on the saving method, then

method A is the more economical for retention. But this strikes us as a falsity, for method A required 4 minutes longer in the learning and one minute longer in the relearning (than B). The reason that it gives a larger percentage retained is that it required so long to learn. The basing of conclusions on the above method and the small number of subjects often used in the experiments brings the author to the conclusion that the whole method has no such clear case as educational authorities often give it. Much data is in favor of part method. An extensive research into the problem is called for. J. D. WEINLAND (Lehigh).

919. HERRING, J. P., The Verification of Group Examinations. *J. Educ. Psychol.*, 1924, **15**, 596–602.

The author finds group examinations appropriate instruments when groups rather than individuals are the object of study. They may also be useful when individuals at one extreme of a very heterogeneous group have to be identified. He gives tables and statistics, however, arguing that it is not sufficient to give group examinations and then verify doubtful and crucial cases by means of individual testing in cases where: "a school class is to be reclassified, with demotion, promotion and re-sectioning affecting the individuals within the group." Individual Binet testing should be a part of the school program and whenever individual remedy is contemplated, Herring advises the use of the individual tests in the first instance. J. D. WEINLAND (Lehigh).

920. HULL, C. L., and LIMP, C. E., The Differentiation of the Aptitudes of an Individual by Means of Test Batteries. *J. Educ. Psychol.*, 1925, **16**, 73–88.

In order to get at a scientific basis for the vocational guidance of an individual it is essential that there be established some uniform scale by which his aptitudes might be measured and their efficiency recognized. This the authors have attempted with some degree of success. The four aptitudes investigated were shorthand, typewriting, high school English, and high school algebra, as obtained from the records of 107 high school students. The tests chosen for the study were taken from Terman's Group Test of Mental Ability, Hoke's Group Prognostic Test of Stenographic Ability, and Downey's Group Will-Temperament Test. Of these Hoke's test proved to be the best for the purpose; and the Downey from which much was expected was rather disappointing. The aptitude test batteries cor-

related fairly high with their criteria, but when they were used to find the difference betwen one's aptitude to do one or more things the correlations were less. The authors meet the same difficulty here that many of us have met namely, the inability to measure *the degree* with the same accuracy that we can measure *amounts* or *quantity* in the same individual. G. M. Michaels (Columbia University).

921. Ruch, G. M., and Stoddard, G. D., Comparative Reliabilities of Five Types of Objective Examinations. *J. Educ. Psychol.*, 1925, **16**, 89–103.

Objective tests have been brought forth many times as valid tests without any satisfactory proof as to their maintained validity. To get a better understanding of the problem the present investigation attacks the question through a survey by means of suitable questions in the social sciences and history. This takes the form of two general information tests of 50 questions each. Every item was presented in five different ways or rather "type-forms": recall, 5-response, 3-response, 2-response, and true-false. The recall test refers to the single blank completion. The results obtained from 562 high school seniors indicate the recognition type less reliable than the recall type of the same items for a constant number of items. The recognition test proved much easier than recall. In general this investigation corroborates the work of H. A. Toops. As we know corrections for chance factors have been used in various ways according to the test. Here the formula for multiple-choice test scores "to minimize the chance elements involved", is used. In this study *the reliability was decreased* in three out of four cases by the use of the formulae. Five out of seven tests in the Terman Group Test of Mental Ability showed a decrease in reliability. The mean scores were also lowered. The formula work best only where n is small. G. M. Michaels (Columbia University).

922. Shen, E., The Validity of Self-Estimate. *J. Educ. Psychol.*, 1925, **16**, 104–107.

Can we judge ourselves more accurately than others or shall we accept the results of Cogan, Conklin, and H. L. Hollingworth whose work show that "the individual does not judge herself as accurately as she is judged by her friend"? Twenty-eight subjects were asked to rank themselves and one another for each of eight different traits: *intellectual quickness, intellectual profoundness, memory, impulsiveness, adaptability, persistence, leadership* and *scholarship*. The con-

clusions are that the inaccuracy of self-estimate is due to a systematic tendency of the individual to overestimate of underestimate himself in all traits. The subject may not be as accurate in the rating of himself in a group, but he is better equipped to judge his relative strength in the several qualities mentioned. G. M. MICHAELS (Columbia University).

923. KNIGHT, F. B., A Note on the Organization of Drill Work. *J. Educ. Psychol.*, 1925, **16**, 108–118.

With the aid of five different tests certain aspects of the psychology of learning when applied to drill work in grade VI are systematically studied. Outlines are given to show the manner in which the work would be accomplished effectively. The author is of the opinion that it is possible to build drill work to specifications. The texts in their present form are found to be lacking in the divisions of drill, organization of drill materials, and distribution of practice. "It is possible to build drill material to exact specifications. With the use of an analysis of the skill for which the drill is constructed, it is practical to provide drill which practices every unit of the total function with a calculated frequency." No particular hardship would fall to anyone if the specifications for the drill material were drawn up first and then divided to suit the specifications. This is a sound scientific policy and a practical one which should not have been overlooked up to the present. G. M. MICHAELS (Columbia University).

924. RICE, S. A., Distribution of Intelligence Among College Students. *J. Educ. Psychol.*, 1925, **16**, 124–126.

The educational attainment level reached by many of our college students is not a real indication of their innate mental capacity. This conclusion is drawn from a comparison of the distribution curves of the general population from which the students come and a study of the records of 401 students. While educational attainment is not entirely unrelated to innate mental ability it shows no correlation within the mental levels of the general population from which the college student is taken. G. M. MICHAELS (Columbia University).

925. WHITMAN, E. C., A Brief Test Series for Manual Dexterity. *J. Educ. Psychol.*, 1925, **16**, 118–123.

This series is void of such factors as mechanical ingenuity, reasoning, or learning ability, but restricts itself entirely to measuring

manual ability. The tests consist of seven items and takes approximately 15 minutes. The items include pegboards of different types and "adjusto trays," and uniform instructions for each item. No marked sex differences are noted, although the boys' scores are slightly higher than the girls' scores in seven of the nine year levels. G. M. MICHAELS (Columbia University).

926. NEWCOMB, R. S., Effective Drill Exercise in Arithmetic. *J. Educ. Psychol.*, 1925, **16**, 127–131.

To test the adequacy of certain psychological theories exercises providing practice on combination of numbers from 1 to 10 with each number from 0 to 100 were given to three groups of pupils, one group acting as the control group. The exercises were arranged on 20 cards 3 by 6½ inches and covered the four fundamental operations in arithmetic namely, addition, subtraction, division, and multiplication. The drill classes showed far greater improvement. These encouraging results bear out the contention that systematic and proportionate drill on higher decades should be advocated with more enthusiasm. The value of the test in producing an increase in efficiency must be recognized. G. M. MICHAELS (Columbia University).

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